

The Canadian Medical Association Journal



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The Canadian Medical Association Journal

VOL. X.

TORONTO, SEPTEMBER, 1920

No. 8

CERTAIN FUNDAMENTAL ERRORS IN THE DIAGNOSIS AND TREATMENT OF MYOCARDIAL INSUFFICIENCY

BY CHARLES LYMAN GREENE, M.D.

Saint Paul, Minnesota

I REGARD it as a signal honour to have been asked to deliver the address in medicine to this body of medical men, embracing as it does some of the most distinguished names in the medical profession, past and present; among others, two of my oldest and dearest friends, recently gone to their reward; the one, Sir William Osler, that great physician recognized the world over as *facile princeps*, than whom no man in our generation has done more to advance the cause of medical science or has held in greater measure the love and respect of his fellows: the other, Dr. Frank F. Wesbrook, late President of the University of British Columbia and formerly Dean of the Medical School of the University of Minnesota, whose entire life was devoted to the advancement of medical science and of medical education and who combined with remarkable ability as an organizer and executive the highest scientific attainments and qualities of heart and mind, such as brought him the love and loyalty of his associates in fullest measure and make it one of the most cherished of privileges to have called him friend.

To one familiar with the state of knowledge regarding alike the anatomy and physiology of the heart fifty or even twenty years ago, the breadth and depth of our present attainments seem almost incredible.

You may think it strange then that I should declare to you,

Address in Medicine delivered before the Canadian Medical Association at its annual meeting held in Vancouver, B.C., June 22nd to 25th, 1920.

that when the crucial test is applied, and we ask ourselves of what benefit and how great all this accumulation of scientific truth has been to the victim of heart disease, I should answer that in the light of its easily realizable possibilities he has benefited but little.

Our plain duty to him is so to use the new knowledge of the heart-beat, its genesis, its maintenance, its registration: so to apply our enormously increased potential advantage represented by our better understanding of aetiology, as to give to him not only promise but large achievement with relation to the prevention and retardation of his ailment and the prolongation of his life.

The medical history of the Great War just won has made manifest the bitter experience of all armies with respect to the unfitness of recruits by reason of cardiovascular defects, and we must recognize and be grateful for a certain amount of knowledge of the juvenile types and the clearer understanding of certain basic pathologic facts which has come to us through this experience. Yet it would appear from a review of the medical literature of the last three years that in so far as this knowledge bears upon the question of the diagnosis and treatment of cardiovascular disease, and the determination of the fitness or unfitness cardiovascularly of the individual for life's service, that we are quite as likely to be led astray and to have confirmed in us the vicious reactionary tendencies of past centuries, as we are to emerge into the light of a better day.

It has apparently done little to advance the cause of the middle-aged and elderly cardiopath whom I have found of late years quite as responsive as his juniors.

The necessity under which medical men worked of dealing with large groups of soldiers necessitated methods and also has involved the stating of conclusions, which, if taken at their face value by the average medical reader and apart from their direct and necessary connection with war problems, might prove disastrously misleading.

My special aim to-day is to set before you as briefly as possible some of the fundamental reasons, as I see them, for our peculiar inability as a body to appreciate the possibilities of earlier diagnoses and treatment and to apply practically and fully modern medical discovery with relation to the heart.

First I must turn back to June, 1912, when I had the honour to deliver the Oration in Medicine before the American Medical Association and chose as my topic, "Prognosis in Heart Disease as Adversely Affected by Certain Medical Traditions."* Our army

**Jour. A.M.A.*, August 31st, 1912, vol. lix., p. 685.

experience has brought out clearly the truth of certain fundamental assertions then made which at the time appeared radical and revolutionary, embodying as they did sharp criticism of long established and accepted methods of diagnosis and attack upon the fatally laggard diagnostic and therapeutic initiative in cardio-vascular disease.

I also emphasized the great clinical importance of the wholly neglected congenitally asthenic heart, so important in civilian and soldier alike.

In medicine, as in other professions, old ideas, even though they be faulty, die hard, and if one examines medical history he finds that in almost every instance the general adoption of a new point of view demands a time-element covering at least one or two decades. The professions seem to be made up of ardent optimists on the one hand and incurable pessimists on the other, with a fortunate leaven of evenly balanced judicial men who give semblance of proper proportion to the mass.

In the case of the cardiopath the optimism referred to is his bane, for it takes the form of leaving him for the most part to Nature whose ministrations, however kindly, are belated, halting and inefficient. The heart is so long-suffering, so resilient, and so extraordinarily enduring under the handicap of chronic disease, as to make us lose sight of the fact that whatever after-lifetime the cardiopath attains is far less than that of the normal man, and might be doubled perhaps, were we to apply every available means to assist him to solve his individual problem, the maintenance of his highest possible degree of symptomless myocardial response.

Even now we overestimate greatly the efficacy of those remarkable but imperfect retarding processes which we term "compensation". Those of us who were privileged to serve in the Great War saw compensatory changes in the juvenile heart at their best, and it was difficult to realize the fact that if these young cardiopathic cases were *as a body* to be taken over by an insurance company the loss would run anywhere from 250 to 500 per cent. above that of an equal number of normal men.

Nine hundred and ninety-nine out of one thousand confirmed cardiopaths to-day owe the major part of their protection from gross decompensation to symptoms, recognized or not by them, which automatically enforce a slowing down of their activities, and most cardiopaths, with borderline reserve, are constantly forcing their diseased hearts.

It is probable that each time the heart's reserve is excessively drawn upon an acceleration is given to the myocardial lesion.

Myocardial reserve represents in the wholly normal heart that marvelous power of immediate painless response to effort represented by absolute rest on the one hand and maximum exertion on the other. We know that the sound, well-trained heart is capable of applying instantly a thirteen-fold increase of power in emergency, but the fact that it possesses that power in the normal, or retains, when diseased, sufficient to carry on the ordinary duties of life, does not mean that any effort should be spared to recognize the narrowing of that field of response and avoid the forcing or driving of the crippled heart.

I have been impressed by the apparent lack of appreciation of the extreme readiness with which myocardial tonus is impaired even in health in the vastly greater number of instances temporarily and harmlessly. Any exertion which is excessive for the individual and produces profound fatigue means temporary trifling impairment of tonus. Excessive heat and vitiated warm air affects it in many individuals. Nutritional deficit tends to impair it. Psychic stress, strain and shock, if intense, may be subtly as potent as physical overstrain; and finally, the first effect of toxæmia from whatever source upon heart muscle is the reduction of tonicity. One has only to review experimental work done not only upon the heart but upon other hollow muscle organs to realize how exquisitely sensitive such tissue is to such influences.

In the diseased or congenitally inadequate hearts, every fresh accession of an existing, primarily causative, septic focus; any decided advance in an already seated inflammatory or degenerative process, will affect to a greater or less degree myocardial tonus and consequently the reserve power of that heart. Many or most of these impairments will be temporary and trivial, but from time to time those of a severer grade or greater persistence occur, the existing pathologic process is accelerated, or the primary congenital weakness is intensified.

Throughout the entire life cycle of the individual cardiopath there is a progressive narrowing, usually infinitely gradual, of his field of response to effort, and it is inevitable that after a variable period such a heart should cry out for relief. As heart cases are managed at the present time it must *shout* for help to obtain recognition.

We must learn to recognize and properly evaluate the subjective

symptoms of impaired reserve and lend our aid in minor as well as in gross and terminal insufficiencies.

To Sir James Mackenzie more than to any one living man credit is due for having persistently and steadfastly set forth the nature and origin of these subjective symptoms, and I for my part consider it the most important of his many contributions to medicine.

Why do we not recognize them at the present time? I have already given one reason, but there are several others.

One of these, and not the least important, is a faulty method of approach. We should teach students primarily to recognize the *normal* heart sounds, for with that knowledge and an understanding of normal variations they can and will detect more readily departures from that normal. As you know, almost invariably at the present time students and practitioners alike approach a case with the primary object in mind of determining the presence or absence of a murmur or, possibly, in the case of the keener ones, abnormal accentuation as well.

In exactly the same way the student's attention with respect to heart disease apart from its signs is directed almost wholly to the detection of the outstanding and easily recognizable evidences of frank decompensation.

The effect of this faulty method is to exaggerate the value of grosser and more obtrusive signs of heart disease, obscure the subjective symptoms, relegate the all-important heart muscle to the background, and leave the cardiopath to his own poor resources.

In despite of more modern and correct teaching the great body of our profession still fails to realize that in heart disease the condition of the myocardium is the all-important question and that, however striking an existing murmur may be, however clearly the presence of this or that organic valvular lesion may be manifested by physical signs, it is the associated inflammatory or degenerative change in the heart muscle itself which is the chief determining factor in the after-lifetime of the individual.

Do not understand that I undervalue the importance of heart murmurs. The clinical history of the individual valvular lesions of the heart varies to a degree which justifies fully their most careful differentiation and placement together with the best possible appraisal of the seriousness of any existing structural valvular defect. It is true nevertheless, that our main study must be the myocardium and our chief effort the detection of any symptoms of importance arising from it.

With respect to the murmurs of cardiac rhythm audible over

the heart I assert frankly that I believe the now dominant opinion is, from the standpoint of the welfare of the cardiopath, unfortunate.

When we read, for example, the statement that murmurs mean nothing and are to be disregarded, we must not take that assertion literally, or in other than its probable intended meaning.

It is perfectly true that the murmur, of itself, means relatively little and this is only in a measure less true if the murmur of cardiac rhythm and heard over the heart represents actual structural disease of the valve. This statement is possible merely because it is not the condition of the valve but the condition of the heart muscle, the degree to which the dominant and fundamental functions of the myocardium are impaired, which constitutes the vital factor.

I do not believe that, in general, murmurs heard over the *apex* of the heart, even though they lack the quality, transmission, and secondary signs of organic valvular lesions are to be classed as trivial, especially in the case of men and women above thirty or thirty-five years of age. To admit this is to permit the elimination of an important symptom of minor myocardial insufficiency.

A review of recent literature balanced against a large personal experience with bruits of this type has convinced me of the falsity of any such assumption, whether the murmur heard be directly systolic or post-systolic. I fear that there is a general lack of understanding of the readiness with which, in the tonus deficiencies, the mitral ring or the papillary muscles become incompetent and permit leakage in a structurally sound valve.

I find that the great majority of such murmurs of apical site act with respect to audibility as exactly like endocarditic murmurs as they could be expected to do when produced by the insufficiency of *normal* valves and find them most valuable signs when occurring *in association with subjective symptoms of myocardial inadequacy*. They, of course, merely reflect deficiencies of tonus but if we are not to note these deficiencies we are not to go far in early diagnosis. Furthermore their changes under treatment are exactly what one expects under the foregone assumption and not in the least what would be the case were they cardio-respiratory or cardio-pulmonary.

It has been gratifying to note during the past year or two a dawning recognition of the unrealized possibilities with respect to the diagnosis and treatment of cardio-vascular disease, and it comforted me when I read a few days ago the statement of one of my distinguished and valued confrères who had long been antagonistic to this view, to the effect that over 50 per cent. of the heart cases entering the wards of the public hospital carried primary myocardial

lesions or inadequacy and that in many instances fatal cases might reveal at autopsy no change, macroscopic or microscopic, which from the pathologist's point of view would be adequate to account for death.

A large proportion of the most serious cases of cardio-vascular disease of the elder group do not express themselves through the frank signs so prominent and easily recognizable in endocarditic cases. Such hearts are silent, and for the most part escape detection under existing diagnostic methods until gross or terminal decompensation occurs. We shall never learn to recognize them until we understand and appreciate the value of subjective symptoms and minor signs, correct our percussion and our standards for the normal cardiac diameters and recognize the presence in our population of vast numbers of congenitally inadequate hearts.

Toxæmia, past or present, recurrent or persistent, is an enormously potent factor. Let us consider the vast influence of infections whether acute, chronic, open or concealed.

The recent studies of the causative agents and portals of infection in acute rheumatism, the better knowledge of the nature and means of detection of syphilitic infection, and the introduction of new agencies and better methods for the intensive treatment of lues, make both the avoidance and permanent cure of these conditions easier and indicate the possibility of greatly limiting the large group of myocardial and aortic lesions of which they are the causative factors.

With respect to focal infections an enormous advantage has been gained for the cardiopath, actual or potential; in other words, in the removal of septic foci especially in the tonsil, or, in middle age, in the gall bladder, and at all ages in the jaws, we have scored a real gain in the direction of retardation and prevention alike.

We have not advanced far with respect to the evaluation of the acute infections, or the knowledge of our duty with respect to the duration of convalescence and the care of patients during and after it. A study made in the United States Army during the war indicated that with respect to the most important and some of the lesser of the many acute infections, the term of convalescence should be doubled at least, and that which applies to acute infections is no less applicable to major surgical operations. The tendency to turn patients out of hospital at the earliest possible moment after operation is most unfortunate.

With respect to hospital treatment, one of the great needs of this time is the establishment of convalescent centres similar to

those that were found so valuable in your army and ours during the war.

Eight years ago I stated my belief, that the essential cause of weakness in the acute infections is the impairment of myocardial tonus which exists in variable degree in every acute exhausting ailment. Since that time a most radical confirmatory change of view with respect to this matter has become increasingly evident in our literature, some of the statements being more extreme than I would be willing to endorse, particularly such as refer to the permanency of damage done.

Certain it is, however, that we should make every effort to teach and practice the recognition of the basic fact and so far as possible inculcate the principle of recognizing these changes as reflected in the heart sounds, the apex beat and sometimes in the cardiac diameter.

Furthermore it is vastly important that individuals who have passed through acute exhausting illness should be examined more than once, if possible, after full convalescence has been completed. The complete restoration of reserve should be our aim and failing in this we must seek to find and so far as possible remove the cause of that failure. My country and yours is full of neglected post-influenzal hearts to-day.

As emphasizing this fact I would remind you that one of the most important, deadly and most short-lived of the valvular lesions of the heart, namely mitral stenosis, does not achieve its classical symptomatology and therefore its ready recognizability until a year and a half or two years have elapsed.

Far more important is the fact that the ultimately fatal chronic myocarditis or degenerative process is peculiarly insidious and gradual in its progress.

Another stumbling block in the road of progress is the false evaluation of the terms "hypertrophy" and "dilatation". At a recent great convention of insurance underwriters the question was raised repeatedly as to why specially selected qualified physicians so often overlooked existing hypertrophy. I shall endeavour to show you through the use of the lantern slides one major reason, namely, a false normal standard of cardiac diameters. Another lies in the fact that the symptoms of hypertrophy now accepted universally are such as would permit the detection of cases of major degrees only.

Dilatation of minor degree in my opinion is one of the commonest of events and is with astonishing frequency silent or attended

only by bruits of the sort too generally described as cardio-respiratory or merely dismissed as accidental.

The faulty methods of determining cardiac dimensions constitute one of the most important factors in erroneous diagnosis and especially operates adversely with regard to the institution of timely therapeutic intervention in the case of the cardiopath. Here again I shall depend upon the lantern slides to be shown to convince you of the truth of this statement, and the congenitally asthenic heart will play the chief part.

For the last fifteen years every case coming to my office has had its cardiac boundaries accurately determined by means of the x-ray. The result of this has been astounding and has demonstrated with the utmost clearness that we have been overlooking and are overlooking still nine-tenths perhaps of the cases of cardiac enlargement. Almost universally there is employed to-day a normal standard transverse diameter for the heart which is utterly without justification.

I should be sorry to know how many physicians, even in this modern time are using the nipple as a landmark. Its position may vary up to 12 cm. utterly irrespective, of course, of the position of the left border of the heart. If you will note where the "mid-clavicular line" would pass in a large number of the chests which I shall show you to-day you will see how misleading is that landmark also.

As a matter of fact there can be no fixed, arbitrary standard; but there is a way of determining whether a given individual should carry a narrow or a normally broad heart. In the former instance the entire transverse measurement may not exceed 7.5 cm.; in the latter it should never exceed 13.5 cm. in the young adult and go but little beyond that even in the middle-aged heavy-weight patients.

It has seemed to me peculiarly unfortunate that during the war, with all of the opportunities for investigation which were presented, there should have been employed no better standard for the determination of cardiac enlargement. As a result many of the statements made and a large part of the figures given cannot be justified in so far as they concern the existence or non-existence of dilatation of the heart.

You will note that even though we allow as normal for the asthenic heart a total transverse diameter of only 13.5 cm. as the maximum normal (a figure several centimetres less than is now almost universally accepted in practice) and apply this figure

without relation to the physical build of the individual a dilatation equal to 6 cm. transverse diameter might exist undetected under present procedure.

A recent measurement of the hearts of aviators, undertaken in the United States Army for other purposes, fully bears out the statement made by me eight years ago with respect to the enormous variation in normal cardiac diameters and the common occurrence of the narrow heart even in most carefully selected young men. Hearts of 10 cm. or 11 cm. measurement were extremely common in these picked men and one measured just 9 cm.

Certain attempts have been made to establish a proportion between the transverse diameter of the heart and that of the chest and the figures given are open to serious criticism. If one, for example, accepts the statement that the heart diameter may be 50 per cent. of that of the chest he will pass as normal many greatly enlarged hearts.

As a matter of routine I make comparative measurements on every x-ray plate, this representing the relationship between the maximal internal diameter of the chest in inspiration and that of the heart. Normal hearts do not run much above 40 per cent. even of the expanded chest and in the congenital asthenic individuals they run definitely under that figure and well down in the thirties.

It is not the enlargement of the heart itself of course which determines the necessity for treatment in any case but the association of such enlargement with subjective or objective symptoms of myocardial insufficiency. The enlargement tells us that a defect in the circulation exists.

In this connection a word should be said about the method of percussion still generally used. This is extremely faulty and results constantly in most serious avoidable error. Extreme accuracy of percussion under ordinary working conditions is unattainable by any known means in a certain considerable proportion of the cases examined. Nevertheless abandonment of the flat-finger method for heart percussion is imperatively necessary, and the use of the tip of the sharply flexed finger applied vertically to the anterior plane of the chest yields reasonably accurate results while increasing rather than diminishing the readiness of appreciation of the resistance encountered.

The use of the flat-finger method is peculiarly inapplicable to the determination of the right heart border and in the case of a greatly enlarged left heart may carry the apparent boundary inches outside the actual profile and into the open air as may be seen if the

measurement thus obtained is laid out in a straight line from mid-sternum instead of following the curve of the chest.

Dilatability. I have been impressed by the apparent unwillingness of certain authorities to recognize as actualities either acute over-strain or acute dilatation of the heart.

Why this should be so I do not know. Certainly any one who uses in a routine way an x-ray machine in his examinations of the heart, cannot fail to recognize the occurrence of acute dilatation and the asthenic heart has demonstrated over-strain to perfection in military service.

I would assert without hesitation that acute, chronic and intermittent over-strain is extremely common and acute dilatation peculiarly so in the case of the congenitally asthenic, or the toxically asthenic heart. I am confident also that in service at the front during the war this last was a frequent occurrence. I certainly have seen and measured acute dilatations in these hearts in civilian life. In one instance, in a patient still living and at present attending actively to his large business, the event has occurred three times, the last occasion being associated with the shock of a major surgical operation and demanding six months treatment for restoration of his original slightly but definitely narrowed field of response.

These statements lead me to a brief reference to certain subjective symptoms of minor myocardial insufficiency.

First. Fatigue or fatigability persisting or recurring from inadequate causes seen in their most pronounced and extreme form in the exhausted hearts of soldiers, though common to all myocardia whose tonus is impaired whether through acute or chronic infection, over-exertion, lack of nutrition or what not, and beautifully demonstrated in the degenerative and luetic lesions of middle age.

In the latter group the protective effect of subjective sensations has freer play in civilian life and careful inquiry may be required to elicit the symptom in many instances.

In decided myocardial insufficiency exhaustion most profound may accompany even slow sustained movements involving the use of the upper extremities, this latter in patients able to walk several miles daily, a peculiarity which hitherto has received no attention but is more or less common in cases of myocardial insufficiency. Movements of the upper extremities involving the raising of the arms seem to be peculiarly trying to the heart and pain or præcordial discomfort also may arise from this cause. In this connection the great difference in demand upon reserve between movements which are occupationally habitual and those which are

unusual and involve the use of rarely used neuro-muscular units must be borne in mind.

Second. Dyspnoea on exertion, this being in part objective is an invaluable symptom and there is none more directly associated with impaired myocardial tonus and reserve; nor is it necessary, as has been asserted, that it should be accompanied by recognizable cyanosis. Fatal cases of heart disease may lack that symptom purely of psychic origin and need not, and must not, be confused with that which occurs on exertion. Needless to say, other conditions than primary heart disease may cause exertion dyspnoea, as for example, emphysema and tuberculosis, but this need not impair the assertion just made, and in either case the myocardium is affected.

Third. Vertigo. Vertigo is a very common symptom in the myocardial exhaustion of the congenital asthenic *if the degree of exhaustion is sufficiently profound*, as was the case so often with soldiers, and the same statement applies to certain of the cases in which the so-called "effort syndrome" of myocardial asthenia arises by reason of infection and toxæmia.

Fourth. Pain and discomfort. The pain and discomfort arising in connection with myocardial inadequacy or exhaustion is merely that of the inadequate, over-strained or over-acting hollow muscle and varies all the way from a mere sense of substernal fullness or crowding or pressure, dull ache or discomfort, to actual angina of the severest type.

The severer type of pain is extremely uncommon in the cases encountered in civilian life.

Referred pain is common and misleading. To a remarkable extent discomfort of cardiac origin may be epigastric rather than præcordial and the number of patients presenting themselves as dyspeptics who prove to have myocardial insufficiency is most surprising and illuminating. In some instances this distress is referred even to the lower left abdominal quadrant or to the region of the gall bladder and in several cases observed by me, operation upon the gall bladder has been narrowly escaped.

In this connection tenderness over the præcordium should be mentioned. This symptom I called attention to some eight or ten years ago and have come to regard it as valuable when present. In my own experience it has been found in connection with what I regard as acute or sub-acute dilatations and over-strain and also and more especially in the slowly progressive narrowly compensated myocardial degenerations with temporary or persisting insufficiency.

In most instances it is strikingly marked over and about the

region of the left border of the heart and in several patients its maximal point defined very accurately the position of this border. It may shift its position as a dilated and insufficient heart retracts its border under treatment. It is seldom persistent for long periods but comes and goes according to the condition of the heart of the patient.

In the congenital asthenics with marked or extreme myocardial exhaustion both pain and tenderness immediately and significantly may attend extreme over-exertion, and persistence in over-exertion may greatly intensify the pain and increase and diffuse the area of tenderness.

The widely diffused and often bizarre areas of superficial tenderness associated with and following true angina pectoris are too well known to need description here.

Fifth. Syncope. In my own experience syncopal attacks have been relatively uncommon but they are easily induced in the individual of the congenitally asthenic type in part perhaps because of the peculiar psychic and nervous instability of these people. In many instances complaints of faintness may be made without actual syncope occurring.

Many other symptoms are frequent, amongst which may be mentioned disordered sleep taking the form of insomnia or its opposite, drowsiness, or the bad dreams so well known as associated events in certain cases of decompensation or in impairment of the intrinsic circulation of the heart.

The diagnostic value of rest, relative and absolute, and of the administration of adequate doses of a potent preparation of digitalis is extremely great and is constantly employed by me in diagnosis.

I have no hesitation in saying that those of you who employ these tests will be astonished to find how many subjective symptoms, often apparently unrelated to myocardial defect or inadequacy, will vanish under their application.

For many years I have endeavoured to emphasize the great importance of a certain large group existing in the populations of all civilized countries, first correctly and fully described under the name of "*asthenia universalis congenita*" by Stiller of Budapest, who gave an excellent description of the type but apparently paid practically no attention to the inherent possibilities of this large body of physically inferior, structurally and functionally unstable and inadequate individuals with respect to cardio-vascular lesions.

During the past ten years I have been endeavouring to emphasize

the great importance of the structural peculiarities of these people in so far as the heart itself is concerned and have given direct attention to the extreme clinical importance of its peculiarities. In 1915, in making a revision of my "Medical Diagnosis",* I predicted that a vast number of such cases would arise in service and prove an embarrassment to the carrying on of military operations and also outlined the clinical picture which such individuals would present.

These persons are born with defective or potentially deficient myocardia and furnish the most typical examples in army service of that condition described originally by the elder Da Costa during our Civil War as the "irritable heart of the soldier" and better still, in my opinion by Dr. Hartshorn, also of Philadelphia, as "heart exhaustion".

During this present war these cases were denominated "soldier's heart", "neurocirculatory asthenia", "neurocirculatory myasthenia", "effort syndrome", and possibly other terms, but fundamentally a large proportion of them, as I had pointed out, were victims of universal congenital asthenia, possessors of asthenic hearts, all representing myocardial exhaustion and none differing in any way from the multitude of cases occurring in civilian practice during all the ages.

In 1917, when acting as Chief of a Cardiovascular Board, I reported to the Surgeon General of our army that we were passing large numbers of these congenital asthenics into all branches of the service who could not prove otherwise than a burden to any command, but practically no recognition had as yet been given to this clinical group and consequently there were no rules of selection in effect at that time adequate to protect the army from their undesirable presence.

As you know, to an astonishing degree they proved an element of embarrassment in the conduct of military operations, many breaking at the outset and during training, others going on and yielding only under the stress of actual front-line service.

Surprisingly one finds in the recent literature little understanding of the fundamental structural and functional inferiority which pertains to this most interesting body of men and women and I would especially lay stress upon the fact that *any and all degrees of myocardial defect* are found to exist in them.

Furthermore, a large proportion of such people, though born

*Greene's "Medical Diagnosis", p. 557, 4th edition

under a handicap, achieve through favourable environment an amount of myocardial reserve and a degree of functional sufficiency which does not permit us to distinguish them from the more favoured individuals of our general population except by the detection and assessment of certain stigmata to be referred to later.

The cases which figure so largely in the medical reports of your army and ours represent extreme cases when regarded from two points of view.

1. The group which broke down at the outset.

2. Those who "carried on" until their greater yet fundamentally lessened reserve yielded to the tremendous strains imposed upon them in actual service or in combat warfare.

It may be added that this same group of individuals furnished a large proportion of the persisting psychoneuroses which were returned to my country and to yours for treatment.

No doubt also the same statement would apply to many of these victims of so-called "shell-shock" who made a relatively prompt recovery and were returned to service.

The congenitally asthenic individual in many instances consciously or unconsciously acquires the habitude of self-limitation of effort and self-protection from adverse influences which threaten his inadequate myocardial reserve.

The chief characteristics of this group are:

- (a) A slender build, in general representing what used to be called the "pre-phthisical habitus", with slender bones, slender and oftentimes poorly developed muscles, an especial flabbiness being present in many cases in the abdominal musculature.

- (b) Most of them are possessed of a long and narrow or flattened thorax with a sharp or relatively sharp intercostal angle.

- (c) All are predisposed to the curious instability of function which is universal, and to another peculiarity of the utmost importance in connection with war, namely, a remarkable dependence upon nutritional reserve and a peculiar instability of this reserve. Furthermore, they are especially vulnerable with respect to infections, and well-defined cases convalesce slowly and often times imperfectly from such infections.

- (d) The great majority of them go on without any symptoms so long as they are well-fed, well-nourished and well-environed. Reverse this and they become subjectively, or, less often, frankly ill.

- (e) More vital than these traits just named is the presence of universal visceroptosis.

Many years ago I pointed out the curious fact that in fluoroscopic

examinations one might make an immediate diagnosis of drop-heart in examining the abdomen and finding a gastropptosis or decidedly movable kidney. So on the other hand, finding the heart of congenital asthenia, one could accurately affirm the presence of a ptotic stomach.

In my work as a consultant during the past twelve or fifteen years as stated all patients coming to the office have been systematically x-rayed and it became evident after this procedure was adopted as a routine that we had in the facts just stated an invaluable method for detecting a type of enlargement of the heart hitherto unrecognized.

This statement rests upon the fact that the heart of the congenital asthenic, being ptotic, is long, narrow and normally falls decidedly or far within the limits universally accepted as normal for the transverse diameter of the heart.

You must not understand that all cases of so-called "effort syndrome" or "soldier's heart" are congenital asthenics. The symptoms characteristic of this syndrome are merely those of profound myocardial exhaustion, extreme narrowing of reserve, and may be produced most readily in these individuals congenitally unfit or potentially so.

On the other hand any and every cause operating upon any heart and adequate to produce a marked diminution of tonus may produce exactly the same symptoms, for these are identical with those shown by individuals carrying normal hearts but subjected to intense exhausting myocardial over-strain.

Indeed, the recognition of the "soldier's heart" rested upon the ease with which these symptoms were produced under physical effort, mental strain, or both combined.

A word should be added as to the ease with which gastrointestinal symptoms arise in these cases whenever nutrition falls below a certain level and myocardial tonus is impaired to the point of symptom-producing inefficiency. Gastric neuroses flourish upon this soil.

It should also be said that one of the most frequent sources of non-recognition of the congenital asthenic habitus is the presence of a large amount of adipose tissue. One constantly encounters men and women who appear sthenic but who really are of the asthenic type.

The fundamental factors underlying the treatment of cardiovascular disease have been dwelt upon sufficiently in the foregoing paragraphs and I shall content myself here by saying that apart from the removal of septic foci the first requisite is timeliness based

upon early recognition of failing reserve; the second, rest, relative or absolute, mental or physical according to individual needs; the third, rational employment of myocardial stimulation, with a careful avoidance of toxic effects; fourth, the improvement of nutrition if this be impaired; fifth, systematic regulation of progressively increased effort; sixth, absolute isolation when necessary; seventh, absolute control of the patient such as in severe cases can be achieved only in the hospital and best with a specially trained nurse; eighth, insistence upon *time* to bring about rehabilitation of reserve and *fix* it so far as is humanly possible; and finally, the keeping of the patient sufficiently under observation thereafter to insure for him that proper direction which is necessary for his protection.

With respect to exercise during treatment, I would give the utmost emphasis to the statement that the patient while under treatment should never be permitted to be "tried out" to the point of producing severe fatigue symptoms. He should be kept steadfastly well within the limits of his reserve. This statement applies to all hearts, but is especially true with respect to the badly exhausted congenital asthenic individuals who can and do often-times lose in one disastrous experience the results of weeks or months of careful building up.

It should not be considered that one may apply safely in civilian practice some of the exercises used in our army or in your own for the rehabilitation of profoundly exhausted myocardia. When dealing with very large groups of men this might be necessary but the individual is entitled to individualization and entire immunity from any or all movements or exercises tending to exhaustion.

The points deemed fundamental by me and covered in this address may before closing be thus summarized:

1. The harmful effect of the traditional optimism on the one hand and pessimism on the other with respect to the course of established cardio-vascular disease and the after-lifetime of the cardiopath.

2. A faulty method of approach which leads one initially to seek to establish the abnormal rather than to prove the existence of the normal.

- 3 and 4. The tendency to undervalue systolic or post systolic apical non-structural *bruits* and, on the other hand, to focus attention upon the valvular lesions rather than the condition of the heart-muscle which is basic in all cases, together with a lack of understanding of the vital importance of tonicity and the readiness and frequency with which it is impaired, and a failure to appreciate

the large proportion of deficient hearts which though diseased are not the seat of valvular disease or of frankly expressed myocardial inflammation or degeneration and are wholly or relatively silent.

5. A failure to recognize fully the fact that the heart invariably is affected in acute infections of an exhausting type and in major surgical operations, the chief source of weakness associated with these conditions being the myocardium; and that in consequence it becomes necessary not only to watch the heart with great care under such conditions but also to insist upon longer convalescent periods than are at present allowed and wherever possible investigate the heart condition from time to time during a considerable period thereafter.

6. The fact that in all probability nine-tenths of the cases of abnormal enlargement of the heart, whether due to dilatation, hypertrophy, or both, under present clinical methods remain wholly unrecognized.

7. Certain fundamental factors of error exist, embracing the almost universal employment of a false normal for the transverse cardiac diameter and a failure to appreciate the extreme variations which may exist owing to fundamental differences in the type of bodily structure. To this may be added the continued almost general employment of landmarks almost wholly undependable.

8. The wide employment of the flat-finger method of percussion which cannot yield accurate results either with respect to the right or the left border of the heart in a large proportion of the cases.

9. An unfortunate tendency to under-estimate not only the actuality but the frequency of a readily produced cardiac over-strain not infrequently associated with lesser grades of dilatation.

10. A general failure to recognize the subjective symptoms of persisting myocardial inadequacy and reserve impairment such as constitute a most important factor of the evidences of this condition when existing in its minor but vital degrees.

11. A failure to recognize the extreme value of rest, absolute or relative, as indicated, and the administration of adequate doses of digitalis as a diagnostic measure.

12. The as yet but imperfectly recognized importance of a type of individuals embracing a considerable proportion of the population who are from birth actually or potentially inadequate, structurally and functionally and in various degrees unable to meet excessive or even moderate stress or strain in life and living.

The treatment of cardiovascular disease at present is in general

inefficient, unsystematic, desultory, halting and fatally belated, whereas it should be early, timely, efficient, rational, systematic and sufficiently prolonged in appropriate cases to secure for the cardiopath the highest possible degree of disease retardation and myocardial rehabilitation.

Finally, as I have stated many times, the failure to apply to the cardiopath the same wise procedure with respect to diagnostic and therapeutic initiative, timeliness, accuracy and systematic thoroughness, together with opportunities for institutional care, which now is granted the victim of tuberculosis after centuries of like neglect is wholly unpardonable.

NOTE:—During the reading of this address Dr. Greene showed 50 lantern slides illustrating the importance of the congenitally asthenic type of heart in diagnosis and treatment alike. The slides showed the peculiar characteristics of such ptotic hearts and the great enlargement which they might undergo in valvular disease, myocardial degeneration, and acute or chronic toxæmia without reaching dimensions which would be regarded as abnormal under the standards at present universally applied. He also showed the curious crossed inheritance through which a narrow asthenic heart and abdominal visceroptosis may co-exist with a powerful musculature and large bones in certain relatively rare instances.

Additional papers bearing upon the points stressed in the address written by Dr. Greene during the past ten years are listed below for the convenience of our readers.

"Asthenia universalis congenita." *N. Y. Med. Jour.*, May 13th, 1911.

"New clinical values in the treatment of the gastric neuroses." *Jour. A. M. A.*, December 23rd, 1911, vol. lvii, p. 2060.

"Neglected factors in the diagnosis of heart disease." *Colorado Medicine*, October, 1912.

"The drop heart: heart of congenital asthenia; hitherto unrecognized importance of its chronic dilatations." *N. Y. State Jour. Med.*, 1914, vol. xiv, p. 391.

"Avoidable errors in the diagnosis of cardiac insufficiencies." *Journal-Lancet*, June 15th, 1915.

"The dilated 'drop heart'—a common and important clinical condition hitherto unrecognized." *Medical Herald*, Kansas City-St. Joseph, Mo., November, 1915.

"Fundamental principles underlying the treatment of heart disease." *Journal-Lancet*, October 15th, 1916.

"The unrecognized heart strains of middle age." *St. Paul Med. Jour.*, April, 1916.

"The prevention and retardation of cardio-vascular disease." *N. Y. Med. Jour.*, 1917, vol. cv, p. 145.

"Cardio-vascular lues." *Journal-Lancet*, 1917, vol. xxvii, p. 289.

"'Soldier's Heart': a misnomer. A common but formerly unrecognized civilian's ailment." Read before the Medical Section of the American Life Convention at French Lick Springs, Ind., March 10th, 1920. To be published in the "Proceedings of the Medical Section of the American Life Convention".

"The rational interpretation of murmurs of cardiac rhythm". Read before the N. D. State Medical Society held in Minot, June 16th, 1920. To be published in the *Journal-Lancet*.

THE SURGICAL TREATMENT OF ULCERATIVE INTESTINAL TUBERCULOSIS AS OCCURRING CHIEFLY IN THE COURSE OF PULMON- ARY TUBERCULOSIS

BY EDWARD W. ARCHIBALD, M.D.

Montreal

WILL you allow me at the outset to express my deep appreciation of the signal honour implied in asking me to deliver this year the Address in Surgery? For that address I made choice of the subject indicated in the title, partly because it was new, and partly because I thought it would be likely to appeal both to internists and to surgeons. It is a subject which has engaged my particular interest since about the year 1912. At that time, in the course of conversation with my friend Dr. Lawrason Brown, of Saranac Lake, the suggestion was made by him that, in view of the fact that bowel tuberculosis frequently began, and sometimes was limited to, the lower end of the ileum and the cæcum, it ought to be a rational procedure to short-circuit the diseased portion of the bowel with the purpose of giving it rest. From that starting point we have gone on, doing at first a short-circuiting, then resections, and in a few a bilateral exclusion or an artificial anus, according to circumstances. In this way there has accumulated an experience of some sixty personal cases together with perhaps a score of others operated upon by my colleagues in Montreal, Drs. Garrow, Armstrong, Keenan, Hill, Scrimger, and Bazin, who have very kindly allowed me to include their cases in this report, and to whom I here express my hearty thanks. The patients have been referred to me by my friends in Saranac Lake, Ste. Agathe, and Gravenhurst, whose help and whose criticisms have been most valuable. In particular I must mention Drs. Lawrason Brown, Kinghorn, Paterson and Baldwin of Saranac Lake, Dr. Byers of Ste. Agathe, and Drs. Parfitt and Crombie of Gravenhurst. It is they who have made the diagnoses and who have suggested to the patient the possibility of the operation. Without their assistance one could have done but little.

Address in Surgery delivered before the Canadian Medical Association at its fifty-first annual meeting, Vancouver, June, 1920.

In what follows I shall speak briefly of the ætiology and pathology of intestinal tuberculosis, and more fully of the diagnosis and the results of surgical treatment.

Pathogenesis. How does the bowel become tuberculous? By what path does the tubercle bacillus arrive in the wall of the gut and find lodgement there? I fancy nine men out of ten would answer, without hesitation, 'by the tract itself, from swallowed sputum'; and that view is a very natural one to take. I cannot deny the likelihood of it. Yet my belief is that the majority occur in a strictly secondary way through the blood, by the breaking of some focus in lung or lymph node into the vascular stream. I cannot here argue the matter for lack of space, but the point is certainly worth discussing, because it has a practical application. For, if the malady is limited to the distribution of any particular artery, one can then hope more definitely to eradicate the disease by eradicating the district served by that artery; whereas if it is a matter of chance penetration of bacilli through the mucosa, treatment becomes immediately more haphazard.

Pathology. In the developed disease it is customary to distinguish two main classes, the hypertrophic and the ulcerative. In the first the reaction of the tissues is of a productive nature, resulting in fibrosis with the formation of an actual tumour, clinically resembling cancer. In the other form the process is largely one of destruction, whether acute or chronic, and there results usually the picture which is seen in the disease as complicating pulmonary tuberculosis. On the other hand the reaction may be of a very chronic nature, and repair may go hand in hand with destruction, ultimately dominating the picture. The result is that a stricture develops at the site of the original ulceration. These three classes represent text-book forms, which is as much as to say that they represent end results. "Living pathology," however (that not quite happy term which is popularly employed to describe the earlier picture as seen during life at operation, in contrast with the end results as seen at post mortem), has taught us to recognize the lesions at a much earlier date. We have become familiar with the early tubercle in the wall before it breaks through to the mucosa and becomes ulcer. From the surgical point of view it is important to recognize these very early lesions. The anatomical situation of the early tubercle, to judge from sections, is usually in the submucosa, and frequently not in the lymphoid tissue of that layer. Occasionally it is in the subserosa; but very seldom, if ever, primarily in the muscle, which is a real barrier to the extension of the

tubercle. Breaking down occurs usually towards the mucosa with the formation of an ulcer, though rarely its extension is in the other direction, through the muscle and towards the peritoneum. Yet, although the muscle is frequently not grossly invaded, the effect of the tubercle is still seen in the tissues underneath the serosa in the way of congestion. The importance of recognizing the early tubercle, clinically, is obvious, and what one has learned from operation is useful in this respect. One can recognize it by a slight nodular thickening felt upon careful palpation, by a general or patchy oedema of the wall of the bowel, through which the wall appears to have lost its elasticity; thirdly, by the presence of a rosette of capillary congestion opposite the tubercle in the peritoneal coat; and finally, by a patch of fibrino-plastic exudate forming a sort of veil or tag upon the peritoneum, which is the result of the irritation, leading to exudation, exercised by the tubercle. As a matter of detail, one must avoid handling the bowel much before thoroughly examining it, because handling may bring out areas of capillary congestion, and simulate in that way a tubercle which is actually not present. At this early stage tubercles recognized in this way may or may not have already ulcerated through to the mucosal surface. At a more advanced stage there is actual thickening of the wall by long standing exudate; there is general contraction of the bowel with diminished capacity, and there are formed gradually, as the result of ulceration combined with irritative overgrowth, papillomatous masses in the mucosa between the main ulcers. If one is going to attempt to operate upon these cases, it is obviously most important to be able to recognize, by external examination of the bowel, where the tubercles are, and the points just mentioned are those which have been most useful in diagnosing their presence or absence in the wall. The ordinary pathological lesions apart from these particulars are known to everybody. The picture usual in tuberculous peritonitis is an entirely different one, and, as a matter of fact, the two conditions are very rarely found together. The hypertrophic form is not considered further in this paper.

Diagnosis. The early diagnosis of intestinal tuberculosis is above all to be desired, because, if surgery is to accomplish anything in this disease, it must attack the condition at an early stage; and this not so much because with the lapse of time extension progresses by direct contact up and down the bowel (for that is probably not very much the case), but chiefly because the lungs are apt to become more and more affected, and the outlook varies directly with the

condition of the lungs. It was thought, therefore, necessary to make a particularly close analysis of the symptoms of *early* tuberculosis, as given by the patients who have come under observation. This analysis has revealed certain points of value. The ordinary text-book descriptions of the clinical symptoms of tuberculous enteritis refer to the later stages of the disease; the persistent diarrhoea, the hectic fever, the pain, the wasting, the entire lack of appetite, the nausea, the vomiting,—all these are late events, and we must not wait for them in order to make a diagnosis, else we shall wait too long. With a late diagnosis the generally accepted hopelessness of the outlook is quite justified. The problem of early diagnosis, therefore, was strong in my mind. I felt sure, to judge from the case histories, that the whole thing was an insidious process, beginning often with a stage of vague distress, long before arriving at the finished picture. But such vague distress is common in tuberculosis without bowel lesions. It occurred to me that, if one went deeply enough into the history, one ought to discover some symptoms which should awaken at least grave suspicion that the bowel had become attacked. The result of this analysis I published in an article in October, 1917, in the *Review of Tuberculosis*. In this place, I need only repeat the essential points.

The first thing to seize is the necessity of regarding any derangement of digestion, or of appetite, or particularly any pain, as being possibly due to a beginning tuberculosis of the bowel. Illuminating in this respect is the finding by Dr. Brown of three positive cases in a routine examination of about eighty tuberculous patients, who had experienced no symptoms whatever referable to the bowel. These were discovered by means of the barium meal, of which later.

In the presence of suspicious symptoms, we have to inquire first, whether tuberculosis has attacked the bowel; and if so, secondly, what part of the bowel is involved.

First, has tuberculosis invaded the bowel tract? In all the cases of my analysis, it was possible to trace certain general symptoms, which might be reasonably considered, at the onset at least, as indicating some one of the conditions of dyspepsia or derangement of the motor functions of the tract so common in the sedentary life of the phthisical person, especially in those on whom overfeeding is imposed. Such general symptoms are briefly, constipation, flatulence, gas in the bowels, slight loss of appetite, a feeling of weight or discomfort in the stomach after eating. Some or all of these are constantly present in patients in whom tuberculous intestinal disease is beginning. Of themselves, they do not naturally

give the diagnosis. But after these come special signs or symptoms. The chief early symptom which should arouse our suspicion is pain. Your ordinary dyspeptic may have epigastric pain suggestive of peptic ulcer in the stomach or the duodenum but he does not have pain below that region. When the patient complains of a pain felt in the mid or lower abdomen, coming on at irregular intervals during the day, but chiefly from the late forenoon or afternoon on, transient often, crampy or stabbing, suggesting gas pains, aggravated by food and relieved by fasting, felt only during a part of the day, but persisting from day to day, then one must be very suspicious of tuberculosis. When in addition, he complains of loss of appetite, of real distaste for food; when he has nausea at times; when he gives up one article of food after another; when he develops a slight fever which is not attributable to his lung condition, and if this persists over three or four weeks, then one may be almost sure of the diagnosis.

It remains to determine what part of the bowel is affected and to what extent. Are there any particular symptoms or set of symptoms which will indicate the exact site of the bowel which is affected? In order to determine this, I divided the cases for analysis into seven classes. First, those in which the appendix alone was involved; second, those in which in addition the cæcum, with or without a part of the ascending colon was diseased; third, those with disease in the cæcum and some part of the rest of the colon, the rectum remaining free; fourth, those in which a large part of the colon with the rectum was involved; fifth, those with disease of the small bowel alone; sixth, those with disease in both small and large bowel; and seventh, those in which suppuration of the mesenteric glands was the only lesion, the bowel being healthy.

I do not propose in this place to go deeply into this part of the subject and must refer the interested reader to the previous article. Briefly, however, this much may be said. Constipation is characteristic of cases in which the disease is confined to the small bowel, while diarrhoea belongs particularly to those in which the large bowel alone is affected. When both are involved there is a stage in which the two alternate, succeeded by a stage in which diarrhoea is fairly constant. When the disease is confined to the small bowel, it is difficult to be sure of its presence, because of the absence of the symptom of diarrhoea and because constipation is so ordinary an event. However, when there is fever, loss of weight, nausea, vague generalized pain, and especially when no soreness, nor any palpable thickening in the cæcal region can be found, then one may suspect that the small bowel alone is involved.

In the colon, the disease is much more easily diagnosed, occurring as it usually does primarily, and often exclusively, in the terminal ileum and the right side of the colon. The symptoms are such as might be expected. They consist chiefly in an early stage of vague distress, followed by chronic mild pain in the region of the cæcum, together with persistent soreness in the same place, and upon examination, a slight thickening of the cæcal wall, which is quite obvious to the trained finger. At intervals there may be sub-acute attacks of pain, simulating appendicitis. With this goes usually some diarrhoea which, however, is at first only relative, and may be absent. The whole process is frequently very chronic. When the transverse and descending colon and the sigmoid are involved there are practically no symptoms in addition to the above upon which to make the diagnosis except, in some cases, tenderness along the transverse colon. These are more or less silent areas of the bowel. On the other hand, when the disease involves the neighbourhood of the anus, one gets the ordinary signs of ano-rectal trouble, discharge of mucus and pus, pain, tenesmus, and sometimes blood.

With increase of experience along these lines it became easy to diagnose fairly early cæcal tuberculosis, long before it was thought at all possible by those whose interest had not been particularly engaged along this line. Nevertheless, it was obvious that a still earlier diagnosis was desirable, and the more so as vague abdominal symptoms are common in tuberculosis, even when the bowel is presumably not affected. One ought to have a more definite and exact means of diagnosis in order to prove one's suspicions, and, also, to demonstrate to the unbeliever that the thing is actually present in a given case. It occurred to me that the *x*-rays might be of value; that a very careful following of the barium meal through the bowel might show the site of ulceration before there were any clinical signs that were definite. In any case, it was important to show, in cases in which diarrhoea was present, exactly where in the bowel the hurry in peristalsis was present. It was a reasonable guess that tuberculous ulcers were the direct cause of the tuberculous diarrhoea. If, then, the *x*-rays could show where the diarrhoea occurred in the bowel, one might assume that at that point there was tuberculous ulceration. Accordingly, some time in 1912, I suggested this line of investigation to Dr. Pirie, in charge of the *x*-ray department of the Royal Victoria Hospital, who was kind enough to take it up, and we worked it out together during

1913, 1914, 1915, by which time we had arrived at the conclusions which I may here briefly set down.

As regards the disease in the small bowel the *x*-rays are of no particular help. Apparently the meal passes along the tuberculous small intestine at about the same rate as in the healthy bowel, or perhaps somewhat slower. In passing I may remark that, just lately, with the help both of Dr. Pirie and Dr. Morgan, we have carried out special examinations for the small bowel, which perhaps may in the future yield us results a little more positive. But, on the whole, the original proposition still holds. On the other hand, when the colon is involved, the *x*-rays are of inestimable help; and I think it is not too much to say, that in no other part of the body, in the matter of obscure diseases, have the *x*-rays justified their use so fully. Certainly, at the present moment, one can assert that with the *x*-rays a very early diagnosis of colonic tuberculous ulceration is possible. The proposition can be stated quite briefly. Where there are tuberculous ulcers, there the colon will not properly hold the barium. In the early stages this is due to hypermotility, which represents some effect upon peristalsis exercised by the ulcers, by which the movements of the colon are hastened, and the barium contents are passed on quickly. In the later stages, particularly as concerns the cæcum, when the bowel wall has become contracted and its capacity diminished by the organization of chronic exudate, the effect is increased. The bowel will not hold the barium, not only because there is hypermotility but also because it can not hold so much as normally. These conclusions have been established by the examination of over forty personal cases; and they have been not only confirmed but also much elaborated by the recent splendid work of Brown and Sampson, of Saranac Lake.* It is true that experience and care in technique and in interpretation are needed, though not so much in the advanced cases as in the early ones. Yet mistakes have been really very few. By the aid of this method we have been able to make sure of the condition at a stage long before the clinical signs could give it with any certainty; at a stage when there was only bowel distress of a very vague nature, and before the onset of diarrhoea. Two recent cases have been particularly encouraging in this respect. They were sent down to me by Dr. Parfitt, of Gravenhurst, with the statement that for two or three months they had been suffering from vague abdominal distress, slight tenderness in the right cæcal region, but without any diarrhoea. In one of them this condition

**Jour. Amer. Med. Assoc.*, July 12th, 1919.

was intermittent. They were examined by the x-rays; hypermotility was found; they were operated upon; the right colon was resected in each, and both patients were able to go home in three weeks with complete relief of symptoms, and with lungs unaffected by the operation. Such cases, previously, would have gone on for a year or more, and would then probably have come to operation when both lungs and bowel might have been too advanced to allow of surgical help.

In illustration of the extreme degree of colonic hypermotility which some cases have shown, I may relate the following instance. The patient, clinically, was obviously the victim of advanced bowel tuberculosis. We were endeavouring to determine whether any signs could be found in the x-ray picture to indicate the involvement of the small bowel, and we were using for this purpose the silver tip of the Einhorn tube, to which we had attached a silk thread, so that it could be controlled and allowed to start at the moment when it reached the duodenum, this being determined by screen examination. The thread was cut at this moment, and a small barium meal was given. The bucket was followed in its course through the small bowel. It took some five and a half hours to reach the cæcum, and that was about half an hour to an hour behind the barium meal. From the time it reached the cæcum to the time when it was passed by rectum with stool, only one hour elapsed; so that in six and a half hours the bucket had traversed the whole small bowel and the large bowel, of which time five and a half hours were taken up in the small bowel, and only one hour, or even a bit less, in the large bowel. In this case operation later showed that the small bowel was very extensively diseased throughout its whole length, as was also the colon as far down as the sigmoid.

I may add that in two or three cases in which the clinical symptoms suggested the possibility, though not the probability, of cæcal tuberculosis, and in which the x-rays showed a normal filling of that part of the bowel, operation later demonstrated a complete absence of tuberculosis. These are valuable control cases, and it may be said, finally, that only in one, or possibly two, cases has the diagnosis been made on the x-ray evidence without finding the disease present at operation.

Indications for Operation. There are two chief contra-indications to operation—extensive and progressive pulmonary involvement and extensive disease in the small bowel. We can make ourselves reasonably sure upon the first point in any given case; we can rarely be sure as to the second. Physical findings and the x-ray picture inform us about the one but not about the other.

Now as concerns the first contra-indication, I think we may say that, if the judgement of the expert in tuberculosis is to the effect that the disease in the lungs is not hopeless, it is then permissible to do an exploratory operation. The determination of the second point, namely the extent of involvement of the small bowel, with our present knowledge, can only be made by an exploratory operation. The indications, therefore, for operation, regarded as an exploration, are quite wide. It has been found that, even in apparently bad cases, the small bowel may be free of disease, and in such the colon being alone affected, operation may accomplish a good deal. On the other hand it has been learned that some patients, who were good risks in so far as their lungs were concerned, have presented a perfectly hopeless condition of tuberculosis throughout the small bowel.

Whenever it is clear that the large bowel is affected, operation is thoroughly indicated, provided the lungs are not too bad and generalized miliary tuberculosis can be excluded. Of course the latter is difficult to exclude except in the rapid, acute form. Many patients are obviously slowly going down hill. They have had fever and rapid pulse for months. The pulmonary disease is active, and the intestinal symptoms are persistent. In such cases it is very difficult to tell which is the cause responsible for the progressing toxæmia, the lungs or the bowel. It should be realized that in some cases neither is chiefly responsible, but rather both, as part of a generalized condition affecting the glands and other abdominal viscera as well. In such cases an operation upon the bowel, which one sometimes performs because it seems to offer a prospect of local relief, and because one is ignorant of a generalized miliary disease, is doomed to failure, and the patient dies within six months from the progress of his general disease. Nevertheless, the apparently serious cases can hardly be excluded from operation even though the operation may have to end in a mere exploration, because sometimes, if one can succeed in putting the diseased bowel at rest, there ensues a quite surprising improvement. The advancing lung condition may be brought to arrest as well as the advancing bowel condition. This is well seen in one case (J. B.) following the establishment of an artificial anus.

The most promising cases for operation are those in which physical examination and the x-ray picture combine to indicate a localization of the disease to the cæcum and the right colon, while at the same time the lungs are but slightly affected and the patient is in good general condition. In these one operates without hesi-

tation. It is true that the small bowel may still be found extensively affected and nothing can be done, but in many cases it will be free and a resection can be undertaken with reasonable prospect of eradicating the disease.

In the section on treatment we shall discuss the indications concerning the various types of operation which come into consideration for different sets of circumstances.

Conduct of the Operation. Inasmuch as practically all the patients have pulmonary tuberculosis, it is important to choose an anæsthetic that will do least harm to the lungs. Gas-oxygen undoubtedly fulfils best this requirement, and the vast majority of our operations have been done with this form of anæsthesia. Morphine and atropine are given half an hour previous to operation, and novocaine is freely used to help out the gas. I have analyzed the operative results with regard to the effect of the anæsthetic upon the lung condition, and have found that in the few cases, some eight or ten, in which ether was used, there was a much higher percentage of anæsthetic ill effects than with gas-oxygen. Indeed the latter, in my experience, never has any obvious immediate effect upon the lungs. In the few instances in which a flare-up of the tuberculous process in the lung was found to follow the operation, this occurred some time after the operation, usually about a week, and the cause was presumably the prolonged fasting during the first week, together with the vomiting of the first day or two.

While it is obviously necessary to avoid the irritating effects of ether upon the pulmonary mucosa, one should also remember that the rapid and deep respiratory movements of induction, as also any violent exertion of the patient on the operating table, must equally be avoided. Undue physical exertion is bad for a tuberculous lung. Consequently I do not hesitate upon a necessity of this sort to ask the anæsthetist to add sufficient chloroform to the gas-oxygen to get the patient quiet. This is not often necessary, and is used only during the beginning of the operation for thorough exploration, and in closing up the abdominal wound if rigid muscles prevent easy approximation of the peritoneum. I have lately come to the conclusion, having regard to the somewhat forced respiration which is frequently seen during the induction of gas-oxygen anæsthesia, that it would be better to begin the anæsthesia with chloroform, administered very slowly and quietly, and then to continue with gas-oxygen as soon as the patient has passed the stage of excitement. In any case the quietest anæsthesia possible is essential. Chloroform throughout is not to be advised.

After entering the abdomen, a routine procedure of exploration is followed out. Practically the whole bowel tract has to be examined. For this purpose I have long used exclusively a long median incision. It is better to make this too long than too short. It should reach from the umbilicus to the pubis, and, if the transverse colon is not easily brought into view, one should enlarge the incision upwards. The colon is first examined, beginning with the cæcum. The hepatic flexure and the transverse colon as far as the end of its second third, as also the sigmoid and upper rectum, can usually be inspected quite easily. The splenic flexure can rarely be seen, and its condition in doubtful cases must be left uncertain. If, however, the transverse colon and the descending colon are involved, one may be practically certain that the splenic flexure is also affected. The small bowel is then followed up from the ileo-cæcal valve. It should be drawn out gently and returned immediately as one proceeds, and approximate measurement should be taken of the distance from the cæcum of the ulcers as they are found. It should be remembered that the distribution of ulcers may be quite irregular. The last two or three feet of the ileum may be free and yet numerous ulcers be found higher up. If, however, no ulcers are found in the distal four feet of the ileum it will be rare to find them above that point. The ordinary thing is to find ulcers in the last two or three feet of the ileum if the small bowel is involved at all; but, being present in that district, it is not uncommon to find the bowel free for several feet above that, and then to find ulcers in the jejunum.

The recognition of the ulcer in the wall has already been described. It is possible, so far as can be judged by results, to estimate pretty accurately the limits of the disease by the mere inspection and palpation of the bowel wall. The operative procedure to be adopted under varying circumstances is discussed below. Where a resection of the right colon is to be done, it is of advantage to tilt the patient over on his left side, at an angle of about forty-five degrees, with sand pillows under the right shoulder and hip. This gives better access to the right hepatic *loge* and keeps the small bowel well down in the left of half the abdomen. It is particularly important to keep the mass of the small intestine well under cover in order to minimize shock and bowel atony. Gentleness in handling and the avoidance of pull on the mesentery are imperative. A saline injection, sub-mammary or intravenous, is frequently worth while. Novocaine has been injected in a few instances into the root of the mesentery, but it has not appeared to lessen shock particularly.

As a matter of fact, shock has been slight as a rule, even quite absent, except where chloroform has been used throughout, as was necessary in two or three cases.

In closing the abdomen it has been found advisable to use stay sutures. It is true that healing is usually quite as good as in the healthy subject; but on two occasions the wound has broken open, exposing bowel, some days after operation. Very probably the local anæsthetic, together with coughing, accounts for this accident. Infection is rare, certainly quite as rare as in the ordinary run of bowel resections.

Post Operative Treatment. Post operative distress is not usually great. Cough can be sufficiently controlled for two or three days with the free use of morphia or heroin. The degree of bowel atony depends on the amount of interference with the mesentery. In resections it is apt to last two or even three days. The anæsthetic that is, gas-oxygen, when kept up for a couple of hours, not infrequently causes a good deal of vomiting, unlike its use in short operations. This rarely begins before six to eight hours after the operation; it merges into the vomiting of bowel atony in resection cases, and may thus persist for as long as three days. This is the symptom that causes most anxiety and most distress. Pituitrin is rarely effectual under forty-eight hours in resection cases. Combined with eserine, each being given alternately every two hours, it seems to do better. But, on the whole, atony is a self-limited trouble; the bowel picks up its work again when it is ready, and seems to be insensitive to whipping in the first forty-eight hours. Intravenous saline, with 5 per cent. glucose, is of definite value, and will frequently stop vomiting more quickly than anything else. Sodium bicarbonate, by rectum or intravenously, is also of use. At the best, however, proper feeding can rarely be resumed after a resection under a week, and this period of partial starvation, with the consequent lowering of resistance, is probably the greatest danger to be feared in the matter of a lighting-up of the pulmonary disease, which, nevertheless, occurs but rarely. Enemata of glycerine and olive oil may be freely used, and are of distinct value.

The Choice of Operation. The localization of the disease varies so much that it is impossible before hand to settle upon any particular operation, so that it is most important to make a thorough exploration. Yet certain types can be determined

1. If the disease involves the small bowel more than three feet up from the valve, it is useless to attempt anything more than the relief of pain, if pain is a serious feature. Resection or short-

circuiting of more than three feet of the terminal ileum is in our experience extremely apt to interfere too greatly with the absorption of nourishment, and the patients go down hill, largely from a relative inanition. Usually pain is not very great, and it is better to close up and do nothing. In such cases, heliotherapy or the quartz lamp, together with iodine internally, should be tried. But it will often be found that the appendix is diseased, and in such cases it should always be removed, for it has been found that this small partial operation will very often give surprising relief to pain, a relief which may last for months.

2. If the disease is limited to the cæcum or to the right colon, including the last one or two feet of ileum, and the bowel is normal from the mid-transverse on, a resection is to be considered. Whereas up to recently I was inclined to do a resection in every such case, I now feel that a distinction should be made. If the lungs are in a favourable condition, I resect; if they are not, I believe it to be better to leave the bowel in, but to cut it completely out of the circuit, establishing a bilateral mucous fistula, and implanting the terminal ileum into the distal transverse colon or the sigmoid. The bowel is cut across a few inches above the cæcum and below the last visible ulcer. The two ends of the excluded bowel are brought into the wound and fastened there. In the event, the patient is left with two small openings which discharge a small amount of mucus and pus, but which are very easily kept clean. This is a much easier operation for the patient than a resection. Moreover, as to resection, it does seem as if the extirpation of tuberculous bowel, in certain cases, removes some inhibiting influence on the progress of the disease in the lungs, which thereupon may become active when it seemed before operation to be stationary. I believe that this operation of bilateral exclusion will in the future be employed more and more.

3. If the disease is found to involve the whole of the colon down to the beginning of the sigmoid, bilateral exclusion is the only operation that can be considered. Resection of such a length of bowel is a mistake in tuberculosis. I have had one patient, whose lungs were extensively diseased in whom this establishment of a bilateral exclusion was followed by very great benefit in every way, although the time elapsed (three months) is still too short to allow of final judgement.

4. In a few cases the disease is scattered all along the colon from cæcum to anus, and in such the bowel distress is apt to be great. I have three such cases to report, in which an artificial

anus at the cæcum, or the terminal ileum, accomplished a great deal. In two, in whom the lungs were normal, the bowel disease was apparently cured. One of these has had this cæcal anus for the last seven years, but, wearing a proper apparatus, is not uncomfortable, has worked for the last four years as a compositor, is married, and has a healthy child. In another, with very extensive and progressive lung disease, both lungs and bowel have improved steadily during the fifteen months period of his ileac anus, whereas he seemed to be a doomed man before. The results of these few cases, in which the tuberculous bowel, though left in, is set completely at rest, are quite encouraging.

Pain at some stage is the rule in any form of intestinal tuberculosis. Yet it varies greatly in degree and in duration. When the small bowel alone is affected, even though extensively, it is often slight. This is in a way fortunate, in that such patients are also the hopeless ones, in whom operation rests at a mere exploration. One can close the abdomen with less discouragement, feeling that the operation has, at least, not aggravated their condition.

Colonic disease, by contrast, is much more apt to be accompanied by pain of such a degree as to render the patient miserable. It is not that the pain is really severe, but rather that it is bad enough to cause more or less constant distress, and at intervals it becomes quite acute. Every meal lights it up; the mere sight of food becomes repugnant, and nutrition suffers. In some cases, it would seem as if the diseased appendix were chiefly at fault, for an appendectomy relieves them to a very large degree. It has been a difficult point to decide whether to do a short circuiting for pain, or to rest content with the removal of the appendix. In the majority a short-circuiting does give great relief from pain, but the diarrhoea is not improved, or is even a little aggravated. And in the worse cases, even pain is not alleviated. If the general disease is clearly progressive in lungs and bowel, and the outlook dark, it is on the whole better not to do the operation. It adds risk and yields an insufficient advantage. In the more hopeful conditions, it may be done. In the one case, the patient dies within a few months; in the other the operation has been followed by great improvement. The small bowel beyond the stoma should always be excluded with a fascial ligature.

The mesenteric glands are rarely large and caseous and are practically never broken down. They are usually moderately enlarged and juicy. In a resection it is not difficult to remove the majority of them with the bowel, but it does not seem as if the patient's chances were injured by leaving a few.

Medical Treatment. Of recent years there have appeared a few articles in which it is claimed that heliotherapy is of decided benefit. In Saranac Lake, Dr. Lawrason Brown (verbal communication) has obtained some quite remarkable results in cases that were hopeless for surgical interference by the use of the quartz lamp. There can be no doubt that the patient's general resistance can be definitely increased in this way, and, unless the patient is obviously in the last stages, these remedies should be tried. The future alone, and long observation at that, can decide which patients should be reserved for medical treatment of this sort, and which should be submitted to operation. My own opinion is that an exploratory operation is proper in all those whose general condition, and particularly whose pulmonary condition, do not forbid it. If the case is thereupon found hopeless for surgery, medical treatment can be instituted with a definite knowledge of the internal condition to go upon; and in this way we shall ultimately be able to determine the actual value of these agents.

A good deal can be done for the relief of pain, flatulence and diarrhoea in certain cases. For the diarrhoea, calcium carbonate in capsules, in the dose of thirty grains three times a day, will often be found helpful. Calcium chloride, intravenously, as recommended by Fishberg, has not proved of value in our hands. For the flatulence and gas pains a mixture of carbonate of magnesia and of the tincture of belladonna, in peppermint water, will often give relief, but can be used only for short periods if diarrhoea is present, as magnesia is laxative. One can then substitute bicarbonate of soda for the magnesia. For pain not relievable by operation one must have recourse to small doses of opium, codeine, or aspirin with phenacetin.

The Results of Operative Treatment. The results of surgery in the hyperplastic and stricture forms are very encouraging. In these it is frequent to find that the lungs are not at all, or very little, affected, and that the focus of intestinal disease is single and therefore eradicable; or in the case of multiple strictures, that the trouble, being chiefly obstructive in its effects, can be overcome by a short-circuiting. The very essence of the trouble in these types lies not in progression of the disease as disease, but rather to the mechanical effects brought about by the tendency towards healing, that is, mechanical obstruction. Hyperplastic tuberculosis of the cæcum causes but little disturbance to the general health, as a rule, until finally it narrows the gut and gives rise to colic. It is likewise with the isolated ulcer of the small bowel which by the course of healing

produces a scar stricture. The obstruction being removed, the patient gets well. Far otherwise is it with the ulcerative form of intestinal tuberculosis, characterized by scattered ulcers, occurring most often as a complication of pulmonary disease, and therefore secondary, sometimes indeed representing a mere part of a more or less generalized tuberculosis. Here surgery confronts an immensely more difficult task. Yet is the burden of surgical decision lightened somewhat by the knowledge that, if surgery cannot avail, nothing can avail. It were too much to say that every patient in whom intestinal ulcers are discovered is doomed. A few undoubtedly recover, with the gradual healing of their ulcers, though some of these come ultimately to the table with obstruction from stricture. And still more, it were too much to say that such patients go *quickly* down hill. Since we have learned the science of early diagnosis, we are finding that some remain stationary for a long time, some go on in intermittent fashion with attacks of intestinal symptoms separated by months of comparative well being, even of great improvement. Brown tells of one patient, in whom operation revealed extensive disease in the cæcum and small bowel. His appendix being removed, he recovered, was practically well a year later, and had gained thirty pounds. Two similar cases are found in my own experience. Nevertheless, as a whole, such are the exception. Once intestinal tuberculosis of the ulcerative form has declared itself, we cannot, *as a rule*, look forward to anything but the ultimate death of the patient, from the progress of his intestinal or his pulmonary disease. The reason is not far to seek. *As a rule* the disease is secondary to open pulmonary tuberculosis; and it has come, as I believe, by the blood. Consequently the fear must be ever present either that the bowel lesions are too widely distributed to permit of surgical help, or that they only form part of a generalized, miliary, blood-borne infection. The picture thus painted looks dark; nor can I assert, upon analysis of our results, that surgery is able, so to speak, to suffuse that picture with light. It can not turn night into day; yet it can certainly make a fair-sized opening in the clouds, through which a reasonable amount of sunshine finds a ready way. To the patient the change in the picture is of untold comfort. Hopelessness gives place to hope. That hope may later be lost; yet is he not dissatisfied. Better to have tried and lost than never to have tried at all, if you will forgive the paraphrase. The patient is glad to take a chance, even if he fail. From the time of Hippocrates and before, the *spes phthisica* has been the comfort of the patient. But that observation is applicable

only to the victim of *phthisis pulmonum*, the supra-diaphragmatic sufferer. With the coming of intestinal trouble, come also the little devils whose abode is in the nether regions of the hypochondrium—the little devils of anorexia, nausea, flatulence, pain, diarrhoea, and “misery”. The patient becomes your true hypochondriac, in the old sense of the word. It has been not a little pathetic, during these last seven or eight years, during which we have felt justified in offering operation to those poor patients, to observe the eagerness with which they accept that offer. No consideration of operative risk, of increased temporary suffering, of possible failure, seem to weigh much in the balance. So much is this true that the conscientious surgeon or physician must guard himself, as well as his patient, from a foolish, uninformed optimism which would rush to operation upon suspicion of bowel tuberculosis, or even upon its definite diagnosis. Both the general matter and the particular patient require study. It should be the endeavour of the competent physician to select the suitable cases for operation, and his duty to say nothing at all about it to the less fortunate ones. We have learned something about the indications for surgical intervention and about the particular type of operation best suited to a given case; but many things are still undecided. An ill-regulated enthusiasm for operation, born of new hope, but uncorrected by knowledge, can only serve in the end to discredit surgery unnecessarily.

The results of operation for tuberculosis of the alimentary tract depend, primarily, upon the extent of the disease in the bowel tract at the time of operation. But it should not be forgotten that they depend also, perhaps to an equal degree, upon the extent of the disease in the lungs. Obviously, the more extensive the disease in either respect, the worse must be the results of operation. A third point of view concerns the results of partial or radical operation designed only to afford palliation of distressing symptoms.

The material for analysis consists of a total of seventy-four cases in which operation has been done. Of these, sixty are personal to the writer. The operative mortality was five deaths in the total of seventy-four, giving a percentage of 6·7, or, taking only the sixty personal cases, in which there were four deaths, a mortality of 6·6 per cent. In the five fatal cases, in only two of which was an autopsy allowed, death was due in one apparently to atonic obstruction of the bowel on the fifth day after operation; three were apparently due to streptococcus infection, either in the mesentery near the anastomosis, or as a general peritonitis, while one seemed to be due to an acute suppurative bronchitis with œdema, leading to

a fatal ending inside of forty-eight hours. Only in the last, therefore, does it seem that the cause could be ascribed to the tubercular condition in the lungs. In the others death was due to the ordinary complications of extensive bowel resections, infection and bowel atony.

In this place it will be impossible for lack of space to make a detailed analysis of all this material. The interested reader may be referred to the writer's previous article for a somewhat closer analysis of the first series of some thirty-three cases.

Taking up *seriatim* the seven classes above described, we may begin with those in which the appendix alone was diseased. Of these we have ten cases, of whom six are alive and well, or else suffering with chronic pulmonary disease, while four are dead from two to six years later, all of advancing lung disease. All were relieved permanently of their appendix symptoms, and in none did the later course indicate a development of bowel tuberculosis.

Secondly, of those in which the cæcum and the right half of the colon were involved there are twenty cases. Of these seven are alive, twelve dead, and the fate of one is unknown. Thirdly, of those in which the colon down to the sigmoid was affected, there are four cases, of which two are alive and two dead, the survival period being three months, and two years.

Of those in which both the small and large bowel were involved there are thirty-two cases. Of these twenty-three are dead, five are alive and four are unknown. Of the five living, two are well and working seven and eight years after operation. In two the disease was not removed, and they are living, one and one and a half years after operation. One is only a recent case within the last few months.

Of those in which the rectum as well as the colon was extensively diseased there were four cases. Of these three are alive and one is dead. All, however, following an artificial anus or a bilateral exclusion, with double mucous fistula, improved after operation and went on very well. The one death was due to the shock of an extensive operation following an artificial anus of one year's duration which had improved the patient very greatly, under which, in fact, the bowel had recovered remarkably.

Of those in which the small bowel alone was diseased there are seven cases. Of these four are dead, the disease being very extensive both in bowel and in lung, while three are alive. In these last there was only limited disease, which could in each case be resected completely, with union of the divided ends. They are all doing

well, but two are rather recent. The other one is well eight years after operation.

Of the seventh class, in which the mesenteric glands alone were involved, the bowel being healthy, there are five cases. Of these two are dead and three alive. Both those who died had extensive suppuration in the glands and had generalized tuberculosis. Of those who are alive, one is too recent to include; the other is well two years after operation, and the last one some eight or nine years.

In beginning this work one cherished the hope that a resection of the whole of the diseased bowel ought not only to eradicate a dangerous focus of disease, but also should indirectly lead to an improvement in the condition of the lungs, which being relieved of the strain of indigestion and imperfect absorption of food, might go on to cure. Consequently resection was done whenever possible. In one case three and a half feet of the small bowel, and in another five and a half feet, were removed together with the right half of the colon. From this point of view it is interesting to make an analysis of the resection cases. It will, unfortunately, be seen from this analysis that our hopes of the beginning have not been, on the whole, realized. A resection of bowel, with eradication of all apparent disease, has not generally, at least, sufficed to bring about any marked improvement in the pulmonary condition. If the lungs were already bad, the disease in them has generally progressed, slowly or rapidly according to circumstances, and the case has ended ultimately in death from the lung condition, even where, as indeed was usual, the trouble in the bowel did not recur and all abdominal symptoms disappeared. On the other hand, if the lungs were not extensively diseased, the results have been decidedly more encouraging.

There have been thirty-one resections in the whole series, nearly all of the right colon, of which twenty are personal. The operative mortality amounted to four cases, or 13 per cent.; in the twenty personal resections there were three deaths, giving a mortality of 15 per cent. Of these thirty-one, there were four in whom the disease was admittedly not all removed, some ulcers being left in the small bowel, and in one case in the large bowel also. In two the end result is unknown. Two are very recent cases. Four died from the operation. Excluding these twelve cases, we have a total of nineteen for analysis as to results. Of these nineteen, seven are alive at periods varying from seven months to eight years, of whom three are under one year. Five have remained free of

bowel symptoms. In one an artificial anus had to be established six months after the resection, as it became evident that the left half of the colon had become involved. He is steadily improving one and a half years after operation. To these good results there ought to be added one other who remained well of his bowel condition for over two years, but who then developed serious pulmonary disease and died three years after operation of generalized miliary tuberculosis. In this series of seven, the lung condition was incipient in two; was moderate in two others, though complicated with laryngeal tuberculosis in one; was rather extensive in one, very extensive in another, and was absent entirely in one. In one the lung condition was slightly aggravated as the result of the operation, and was unaffected in the rest. In the very advanced case the lungs are now improving. The relief from symptoms has been practically complete in all. When one reflects that these patients, if they had not been subjected to operation, would almost certainly have got progressively worse as regards both lungs and bowel, one can hardly avoid the conclusion that operation has been eminently worth while.

On the other side of the account must be put the four operative deaths, in all of whom, however, the pulmonary condition was extensive and prognosis dubious, and also the series of thirteen cases in whom death occurred from the progress of the disease in from three months to three years. Ten of these died in from three to nine months, most of them from their lungs. One lived three years, as mentioned above. One died from acute obstruction in seven months, without symptoms of bowel recurrence. Four lived from thirteen to sixteen months, all in great comfort so far as their intestines were concerned, but died of progressive disease in the lungs. In the great majority, even of these fatal cases, the relief from bowel distress was complete or nearly so. In four, it looked as if the operation had caused some aggravation of the pulmonary disease, but only in one of these was this aggravation of a serious nature leading in itself to earlier death.

On the whole, therefore, we may conclude that in these cases which, left to themselves, are, so far as we know, doomed, resection is justified if the disease can apparently be eradicated and if the lungs are not too seriously involved; and that even when the lungs are so, resection can be expected to relieve them from troublesome bowel distress.

There are a good many cases in which exploration reveals disease too widespread for eradication. Some of these have been

closed without further interference, but in the majority the appendix has been removed, as it is usually diseased, and it has been found that very frequently this has a very gratifying effect in the relief of pain, a relief which may last for several months. It is always well to do this. In others, a short-circuiting, usually of the ileum into the sigmoid, has been done. Of these there are ten cases, of whom six died of progressive disease within three to six months after operation. The operation was usually done for the relief of marked bowel distress. In this respect, when the bowel was very extensively diseased, the relief obtained has been hardly sufficient to encourage one in doing the operation as a routine. Pain is, it is true, frequently relieved to a marked extent during the first two or three months, after which it is apt to return; but diarrhoea is usually not improved and may even be made a little worse. Of the other four three are alive and the fate of one is unknown. One is too recent to be counted, though her symptoms are entirely relieved; one in whom the disease involved only the cæcum and right colon, the small bowel being free, got great though not complete relief, but is steadily improving eighteen months after operation. In this case the lungs were only slightly involved and the condition was stationary. The third was a most brilliant result. This patient (operated upon by Dr. Bazin, of the Montreal General Hospital) had quite extensive disease of the jejunum, ileum, and cæcum, but disease of a chronic nature, which had led to a partial stricture in the lower ileum. He was operated on under a diagnosis of acute appendicitis. His lungs were moderately involved. Dr. Bazin cut across the ileum just above the stricture and implanted the proximal end into the sigmoid. After a stormy convalescence, during which the lung condition was somewhat aggravated, he eventually recovered, and recovered so completely that at present, over six years later, he is well and working. Such a case is in itself almost sufficient to justify routine operation in intestinal tuberculosis. It illustrates, however, the necessity of distinguishing between the cases of chronic type with some tendency to repair, as seen in stricture formation, and those of a more acute and progressive character in which the load of advancing disease, both in lungs and bowel, can not be borne even when part of the disease is removed or set at rest.

It is in the very nature of the disease that the victims of intestinal tuberculosis should, by the time they come to a surgeon for help, be also the victims of advanced pulmonary tuberculosis. The results of operative treatment must, therefore, from the

beginning be understood as being heavily handicapped. So much is this the case that prognosis, *quoad vitam*, is based even more, perhaps, on the condition of the lungs than upon the extent of the disease in the bowel. For analysis of the cases from this point of view four classes may be set up, according to the extent of the disease in the lungs. First, those without pulmonary disease discoverable by physical examination. Of these there were fifteen cases in the whole series, of whom eight are alive, three dead, and the fate of four unknown. The cause of death in these three was not tuberculosis. When, therefore, the lungs are not affected the outlook for surgical interference is very good. Second, those with early disease; of these there were eight cases, of whom five are alive, two dead and the fate of one unknown. Third, those with extensive disease, but disease of a chronic, very slowly progressing, or even stationary nature; of these there were twenty-six cases, of whom twelve are alive and fourteen dead. Of the latter, four died from the operation, while ten succumbed in the majority of instances to the progress of their pulmonary condition. Fourth, those in whom the disease was not only advanced but progressive; of these there were thirty cases, of whom only three are alive while twenty-four are dead, and the fate of three is unknown. The majority of these twenty-four died in less than a year from the time of operation. In a later paper I hope to analyze these results more closely. But in the meantime the figures indicate sufficiently that when the pulmonary disease is serious and shows a tendency to progress, very little can be expected from operation as regards the saving of life. One should not forget, however, that even in these serious cases the relief from distressing bowel symptoms has often been so considerable as to justify the operation.

When one considers the subject from a panoramic point of view, one is forced to the general conclusion that the basal principles which have been found to hold good in the treatment of pulmonary tuberculosis apply also in the case of intestinal tuberculosis. The virulence of the bacillus, the character of the soil, the resistance of the individual, all combine to form certain types or classes as regards prognosis, which the expert learns to recognize instinctively. In one the general tendency is certainly down hill; in another a truce is called and the disease is held stationary; in a third the tendency toward cure by fibrosis is marked. In bowel tuberculosis these same tendencies can be recognized, and indeed frequently run parallel with similar tendencies in the lungs. Results vary pretty well according to the predominance of one or the other. They may

be absolutely brilliant in the best cases, and absolutely discouraging in the worst. Prognosis, on the whole, is perhaps best gauged by a consideration, primarily, of the extent and course of the lung disease rather than by the extent of the bowel involvement. In every case, when deciding upon the advisability of operation, or upon the type of operation to be done once the disease is exposed, one must be guided by a very careful analysis of the patient's condition as a whole, with special regard to the patient's tendency towards progress or regression of the disease.

CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS

THE tenth annual session of the Clinical Congress of the American College of Surgeons will be held in Montreal, October 11th to 15th, and the provisional programme is published in the August number of *Surgery, Gynecology and Obstetrics*. This will be the first meeting of the organization held outside the United States, and the Local Committee on arrangements is working hard to have the programme compare favourably with those presented at former meetings in Chicago, New York, Boston and Philadelphia.

Clinics will be given forenoon and afternoon at the following Hospitals: Montreal General, Royal Victoria, Western General, Hotel Dieu, Notre Dame, St. Justine for Children, Children's Memorial and Montreal Maternity. At headquarters (Windsor Hotel), afternoon sessions will be devoted to the discussion of various subjects introduced by local surgeons and participated in by a number of the visitors. In the evenings papers will be presented by men prominent in the profession.

The annual business meeting will be held on Thursday, October 14th, at 4.00 p.m., in the Windsor Hotel. The eighth convocation of the College will be held in the auditorium of St. James Methodist Church on Friday, October 15th, at 8.00 p.m. As at former meetings admission to all sessions will be by ticket issued to Fellows of the College who register and to guests of the Congress.

The limitations of hotel facilities in Montreal have caused some concern but the situation has been met by the Local Committee opening a registration bureau with offices at 836 University Street—application for accommodation should be filed without delay.

PSYCHIATRY AND INTERNAL MEDICINE

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AN invitation to discuss the subject of psychiatry in its relation to medical practice cannot but be accepted with diffidence, for strangely enough, the problems of mental disease are supposedly outside the pale of internal medicine, even though their proper understanding is of paramount importance to the success of every physician.

What the term psychiatry really means is by no means clear to the profession as a whole to whom for the most part it implies the care of inmates of the "madhouse".

The *nomenclature*, in its appalling looseness of application, has formed a bone of contention between various groups of nerve and mental specialists. How wide, or how narrow is the range of psychiatry? How intimate shall be its association with the hysterias, the neurasthenias, and all the other mental and so-called nervous disturbances, on which the physician delights to confer the title "functional"?

If hysteria is regarded as an abnormal state which may be produced by, or cured by suggestion, one may well include many of its phases in the narrowest scope of psychiatry. But what of all the functional disabilities, the reflex paralyses, and the myriads of types we have seen during the past five years of world conflict?

The experiences of the War, however much they have stimulated research in and understanding of neuroses, have failed to establish a nomenclature that is universally satisfying.

So difficult has been the problem of differentiating between cases that are neurological, and those that should come under the aegis of the psychiatrist, that the newer and more inclusive title "neuro-psychiatry" now obtains in many clinics.

It is in this broader sense that I beg leave to consider the subject.

Perhaps nothing is more striking in the evolution of medical

science than the persistence with which therapeutic traditions have lived on through the centuries, traditions filled with superstition, with occultism and mysticism.

The ancient Egyptians with little knowledge of scientific medicine may be forgiven for seeking a cure for disease at the Temple of Isis; the Orientals with their atmosphere of mysticism may be pardoned for their worship of the magic and occult; we may excuse the Latin and the Anglo-Saxon of mediæval times for their credulous adherence to the alchemy of Paracelsus. Nor is it a matter of wonderment that Mesmer's house was thronged with seekers after health by means of magnetism and the "universal fluid" at a time when scientific medicine was advancing by leaps and bounds.

But what are we to say of the modern physicians, the modern clinicians and teachers, who look with equanimity upon the inroads of charlatanism upon scientific medicine, who fail to stem the tide of illegitimate practice, who watch with apathy the success of occult methods, and who see the failures of their consultants made conspicuous through the success of those engaged in the practice of mystic arts.

Nor can we, after all, deny that in the methods of modern occultism there lies a fundamental germ of truth, the understanding of human nature, the domination of personality over personality, the treatment of the individual rather than of the disease.

In general practice to-day far less time is devoted to the study of personality, temperament, character, or disposition, than to the detection of organic lesions and focal disease.

Ætiology. The ætiology of psychopathic change presents many problems of intense interest. Is it physical in origin, or is the factor chiefly psychic?

If physical, is it anatomical, bio-chemical, or molecular? To what extent is the Mierzejewski effect worthy of consideration, I mean the disharmonious development of gray and white matter (gray being in excess), by means of which the commissural system is thought to be deficient? And again, what about the so-called "normal-looking" brain of the feeble-minded? Is there such a thing as functional feeble-mindedness? Are the psycho-neuroses merely discords played upon good instruments? as Southard asks. Consider, with Fernald, all the problems that associate themselves with mental disease: developmental mechanics, glandular dysfunction, unequal development of organs, dislocation of cells, their premature pigmentation, the effects of alcohol, of syphilis,

of heredity, and we see how far-reaching may be the effects of the physical on mental processes.

Most striking of all the newer research, is that concerning the association of the glands of internal secretion with mental disturbance, and the effects of glandular therapy. The remarkable observations of Fernald on the thymus gland, and on the relation of psychic changes to endocrine function are but other instances.

But perhaps the physical origin of psycho-neuroses has been somewhat *overdone* by the internist who has oft-times confused the effects of the knife and the drug with those of suggestion.

We have been apt in the past to ascribe to auto-intoxication, to low-grade sepsis, etc., the factor in obscure psychoneuroses, and more recently the extirpation of the colon has rivalled extraction of the teeth in curing all manner of functional disturbances. At times, it is true, results would seem to justify the performance of some of these radical measures, but sadly enough the psychiatrist vainly awaits in oblivion, outside, for an invitation to counsel and help.

That even the moral character may be obviously changed and that various mental complexes may arise through direct physical agency is well exemplified in the case of one individual under my own observation, who, at the age of forty-five, became a moral degenerate without appreciable cause. It was the subject of criticism in the community, until the oculist discovered a choked disk, and the neurological surgeon removed a tumour from the brain.

Organic conditions, then, and physical defects are undoubtedly responsible for mental conflicts, conversions, complexes, etc., but I protest bitterly and earnestly against the surgeons who undertake independently the supervision of such cases without previous reference to the psychiatrists, who alone are capable of forming a sane judgement.

Regrettable as the confession may be, we are all of us familiar with instances where operations have been done for the mental effect. Is it not appalling to learn that a surgeon of repute would, without psychiatric advice or consultation, operate for this purpose upon a woman aged sixty-five, the unfortunate victim of the mental delusion that she was pregnant?

So much, then, for the physical cause of mental disease.

Psychic Causes. As to the psychogenesis of mental and physical disease much might be written. It must be assumed that many physical conditions are directly preceded by psychic factors, that headache, vomiting, delusions, etc., are often psychogenetic in their origin. There is no doubt whatsoever, that subconscious

disturbances may equally affect the mental health and act upon the functions of synaptic groups. Nay more, when we consider how in every motor act but two or three neurones are concerned, that with sensation but four or five, how much more complex must be the mental states with shocks and associated memories, where innumerable neurones and synapses are involved.

Worry, disappointment, grief, are all factors in producing insomnia, irritability, abstractions, or worse. The cause may be a concealed one, but it is the psychic factor alone which needs treatment. One must remove the cause of the emotional change rather than administer drugs.

The fact of the matter is that all this goes to show that in the detection of mental abnormalities a correct *ætiological diagnosis is essential*,—a diagnosis of both the physical and mental conditions, for the complexity of psychopathic cases is beyond all belief.

It is important to remember that many people are committed to asylums who would be far better off elsewhere, and that mental disorders and mental symptoms are not synonymous terms.

One is apt to talk rather glibly about a patient having "lost his reason", having "lost his senses", when, as a matter of fact, the mental disturbance may in no way have affected the intellect or the reason, while the changed emotions *alone* may be responsible. The patient has merely "lost his table of values", and is much like a child who cannot adapt himself to his environment, and the inner harmony is lacking.

It is in just such conditions as these that the physician, be he a general practitioner, or be he skilled in the refinements of physical diagnosis, is apt to fall short. No inconsiderable training is required before one's opinion becomes of value.

Ætiologically and symptomatically, the behaviour of the sane and insane is largely one of degree; certainly this is the case with neurasthenics. The chief difference between them is in the mental conflict, which requires careful analysis and consideration. The general practitioner is called upon to decide between the sane and the insane, to diagnose exactly, if he can, between types of personality, if you will, and to advise as to disposal. To commit, or not to commit, that is the question, and the decision is oft-times an urgent one. He is called upon to decide as best he can between the emotional and the intellectual, to deal with disorders of human adjustment, and with distorted methods of meeting the complex situations of life, all of which are problems the solution of which requires specialized training.

He must be skilled in questions of mental hygiene, of adaptability to environment, and the reactions that arise therefrom, and no one untrained in psychology should presume to offer a final opinion.

It is obvious that the general practitioner is called upon to decide something in which his previous training has been defective. He has not learned to appreciate the degrees of personality; in fact, he probably does not pre-suppose a personality in most of the patients that come within his ken. Now psychiatry teaches us that each human being may be categorized so far as his personality is concerned in one of three groups,—such, for example, as Adler suggests:

(a) Paranoiac, i.e. the egocentric individuals, the reformer, the altruist, the seeker of the lime-light, or the ill-natured and unappreciative personality.

(b) Inadequate personality, which includes the mentally defective, the feeble-minded.

(c) The emotional, unstable personality, excitable, irritable, hyper-sensitive.

Now, inasmuch as the pathological personality may form that large class known as the border-line type, it is obvious that a training in psychiatric diagnosis requires a fundamental knowledge of psychology.

Unless the physician can appreciate that human conduct is dependent upon certain fundamental reactions, unless he can understand the patient in all these relations, his task of disposal and treatment is a difficult one. Consider the immense multitude of people outside of institutions, who would be the better for such care. Consider the numbers under supervision, or parole; recall, in fact, the myriads of border-land types in every country, and we can gauge the magnitude of the physician's task in diagnosis and disposal.

It is just in these very matters that the physician is apt to fall far short of the ideal, to lose patience, to become apathetic, indifferent or critical. It is a lamentable, but well established fact, that many of these psycho-neurotics, as a result of mal-adaption, or what not, commit offences of major or minor importance, and are regarded merely as infractors of the law and not as psychopaths.

The jails and reformatories are filled with people of this kind, who should long ago have come under the skilled attention of the psychiatrist.

Consult the statistics of Bernard Glueck, and you will realize that feeble-mindedness is a matter of crime and degeneracy, that it is a great economic burden on any country, and that its recognition is an urgent matter of governmental policy.

In Auburn prison alone, 67.1 per cent. of the inmates were mental abnormalities. In Westchester County penitentiary 57 per cent. likewise were mentally pathological.

The general practitioner, as a rule, is more or less in despair over mental cases unless the type he be confronted with is an outspoken one of mania, dementia, or melancholia.

One can well picture the helplessness of the average physician who is consulted about a feeble-minded child as to disposal or treatment, or any other information.

Indeed, I fear it is a rare thing for a physician to take sufficient time with a psychopathic patient to get more than merely the broadest outlines of his trouble.

It is a wearisome matter for physicians—these tales of worry and grief, and failure—and the patient is more apt than not to be told to forget his worries, to take a holiday, or to go to work, the physician forgetting that work should be the *sequel*, but not the *substitute* for the doctor's own labours.

Not alone is this the case with psychopathic cases, but in all organic nervous disorders the physician overlooks to a surprising degree the functional element.

Medicine of the War has demonstrated this, and Hurst at Seale Hayne, and many others have shewn the degree to which the functional side may be developed.

Two striking instances are noteworthy:

1. A hemiplegic, bed-ridden eleven months, and with contractures, was made to walk in forty-eight hours, the lesion resulting from his cerebral hæmorrhage having been so slight as to leave but a few evidences of organic disease.

2. Friedreich's ataxia, crippled, but so cured in a few days that he could resume his vocation, the pathological reflexes and a few other signs alone remaining as evidence of the underlying organic disease.

The Neglect of Psychiatry. Wherein lies the difficulty, and what is the result?

The causes are many. First and foremost, we must depart from ancient traditions and prejudices. We must learn to look on patients with mental disturbances as something apart from madhouse inmates. We should be done with the era of straw and chains, and

patients with all forms of mental disease should be as carefully and considerately observed, treated and relieved, as those with any disease of the lungs, or heart, or digestive tract.

In almost every Medical School in Anglo-Saxon countries, psychiatry is dealt with as a minor subject. The course consists of a few didactic lectures; a few, very few, visits to a lunatic asylum, where the demonstrations are apt to be more a theatrical than an educational exhibit. Chiefly, the rare well-advanced types of mental disease are exhibited, veritable caricatures of mentality.

The teaching of psychiatry has well been compared to a course of instruction in navigation, carried on by the inspection of a few wrecks; or by a training in engineering, through the exhibition of a few broken-down dynamos,—and all this, too, in spite of the fact that there are in public institutions more insane patients than of all other diseases put together.

Border-line cases, on the other hand, unusual personalities, cases on parole, can neither be stressed or discussed, for *ipso facto*, they do not exist in asylums, when no case can enter an asylum that is not legally committed. The result is that instruction in our schools is necessarily limited, and few students have opportunities to study the most important feature of psychiatry, viz: the border-line cases.

We must treat cases early, and treat early cases; must recognize the importance of treatment out of asylums; of forming pavilions or departments in general hospitals, where till now such cases have always been unwelcome guests.

We must educate the public away from fear and prejudice, and cast off the stigma that attaches so wrongfully to these types of disease. Prevention is still better, by medical clinics in the courts, by education, and by the organization of adequate social service.

Moreover, there is urgent need of an adequate course on psychology in its application to medicine and psychiatry. It must be made a living subject, and in order that it may be duly appreciated, its study should follow upon the instruction in anatomy and physiology.

These two latter subjects should be (and I am glad to say now usually are), dealt with in a much more practical manner, the former emphasizing the relation of functions to structure, while in physiology mental processes are being more and more emphasized.

Personality in all its relation to abnormal and normal conditions must be an important consideration in every general clinic.

It may be claimed that the study of personality is an easy

matter. Nevertheless, let a doctor be never so talented, he cannot by personality, by natural insight, and understanding alone, deal with mental disorders, any more than he can decide by his personality as to hepatic, or renal or cardiac insufficiency. One must be taught to study the reaction of disease, and too much stress cannot be laid on the importance of the functional element in all organic lesions.

Let us see to it that not only are students and physicians given all opportunity to learn more of mental diseases, but let us by every propaganda at our disposal educate the public to appreciate the greatest hygienic and economic problems in state medicine.

Thus, and thus only, can our country be saved from waste of energy and capital, and from an incubus of misery and inefficiency that is to-day appalling.

Light is happily coming, and through the efforts chiefly of the patient, persistent and patriotic physicians of your own city, psychopathic establishments are growing, and with the co-operation of all members of the profession and State, we may be justified in some optimism.

ACUTE INTESTINAL OBSTRUCTION WITH SPECIAL REFERENCE TO DIAGNOSIS

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ACUTE intestinal obstruction may be defined as the sudden and complete arrest of the onward passage of the intestinal contents. This may occur in a normal bowel, or in a loop of bowel previously the subject of partial obstruction.

During the early part of the antiseptic era of surgery, the mortality of this affection is given in the standard works of that time, as approximately 70 per cent.¹ By the end of the nineteenth century, it had been reduced to approximately 60 per cent.² and the latest reports of large series of cases give a mortality of from 40 to 45 per cent.³ DaCosta⁵ thinks that the present mortality of both published and unpublished cases is still over 60 per cent. The late John B. Murphy stated that, "The one lesion of the abdomen, the mortality of which has not been diminished in a third of a century, is intestinal obstruction."⁶

The leaders of surgical thought of the present day all deplore the slow progress made in the treatment of this malady as compared with progress in the treatment of the other acute abdominal lesions. They are unanimous also that the present mortality rate is unnecessarily high, and, that this is due to delay in resorting to operation. Moynihan⁷ says, "Anything over 10 per cent. is the mortality of delay." The dangers of delay were forcibly stated thirty-five years ago by the late Hunter McGuire⁸ and have been insisted upon by every surgical writer since his time. The general practitioner who is usually called first, must therefore be fully seized with the importance of early operation. It is reasonable to assume also that this delay is due to uncertainty in diagnosis.

The main purpose of this paper is an attempt to account for this uncertainty and to propose a remedy.

His uncertainty in diagnosis may be attributed to two sources. First, the infrequency of intestinal obstruction. One case is said

Read at the fifty-first annual meeting of the Association, June, 1920.

to occur in approximately every 10,000 to 20,000 of population. In the Province of Manitoba, the vital statistics give an average of twenty-nine deaths a year due to intestinal obstruction, or approximately sixty cases in a population of six hundred thousand. A practitioner of several years' standing evidently may never have seen a case. He appeals to the modern text-books on medicine and surgery. In them, I believe, will be found the second and chief cause for his uncertainty and delay in diagnosis. In none of them will he find a description of the symptoms of obstruction apart from those of its complications. A few quotations will suffice to make this point clear. The following are taken from the text-books in use in the medical schools of this continent.

"Vomiting follows quickly and is a constant and most distressing symptom. At first the contents of the stomach are voided, then greenish bile stained material, and soon in cases of acute and permanent obstruction, the material vomited is a brownish black liquid with a distinctly faecal odour. This sequence of gastric bilious, and finally stercoraceous vomiting is perhaps the most important diagnostic feature of acute obstruction."⁹ "Eventually stercoraceous or faecal vomiting takes place and is the most characteristic symptom."¹⁰ "Early reflex vomiting from shock, voiding in succession the gastric contents, bile and faecal matter which usually consist of yellow-brown or black fluid, or very rarely solid faeces, is strongly indicative of organic strangulations."¹¹ "The vomited matter soon reveals a feculent odour, and finally the dreaded faecal vomiting takes place."¹² "Collapse with hypocretic expression, weak pulse, hurried breathing, may occur early or later from peritonitis."¹¹ "The pulse becomes rapid and feeble."⁹ "Vomiting ensues, being at first limited to the contents of the stomach, but quickly changes to a bilious stercoraceous or even faecal character. Signs of exhaustion follow in a short time, the pulse becoming weak, rapid and thready."¹³ "The pulse is small, rapid and irregular."¹⁴

The use of such indefinite terms as "soon", "quickly changes," "follow in a short time," should be avoided, if possible, in a matter in which the time element is of so much importance. The clinical picture presented is that of the late rather than that of the early stage; at least, the emphasis in all the text-books I have examined, is placed upon the late rather than upon the early symptoms. The perplexed practitioner consequently may be excused if he waits for the appearance of some of these late symptoms before making a positive diagnosis. The remedy I propose for late diagnosis is, then, an effort to formulate the symptoms of the early stage; and, as a

contribution to this end I submit a study of forty-three cases. The number is too small and the records too imperfect to permit of positive conclusions, yet they are sufficient to show that the formulation of an early stage clinical picture is not impossible.

(1)			ÆTIOLOGY		
STRANGULATED HERNIA:			Cases	Deaths	Per Cent.
Inguinal	8 cases	1 death	15	4	26.6
Femoral	3 "	1 "			
Umbilical	2 "	1 "			
Ventral	2 "	1 "			
Adhesions the results of a previous peritonitis.....			7	4	
Adhesions the result of a present peritonitis..			7	5	
Bands constricting the bowel.....			5	2	
Meckel's diverticulum			2	0	
Intussusception			2	1	
Volvulus of sigmoid.....			1	1	
Hernia in duodenal—jejunal fossa.....			1	0	
Operative closure of wrong end.....			1	0	
Thrombosis of mesenteric vein.....			1	1	
Not determined.....			1	1	
			43	19	44.2%
(2)					
Number operated within 24 hours.....			9	1	11.0
" " " 24-48 hours.....			9	2	22.2
" " " 48-72 "			10	5	50.0
" " " 72 plus "			13	9	69.2
Total operated upon.....			41	17	41.4
Number not operated upon.....			2	2	100
			43	19	

1. *Mortality.* Operation during the first twenty-four hours will save at least 90 per cent.; each day's delay after the first day adds approximately 20 per cent. to the mortality. These statements are amply established by the published records of large series of cases such as those of Deaver and Ross,³ Warren⁴ and others.

2. The symptoms of the first twenty-four hours were recorded in twenty-eight of these forty-three cases. In twenty-one of the twenty-eight, the only symptoms present were pain, vomiting and constipation. Two of the remaining seven had local tympany; two had a palpable mass (cases of intussusception), and in four the pulse rate was accelerated.

3. *Primary Shock* is recorded as having occurred only once in those forty-three cases. This was in a child of eight years, the subject of high obstruction, and in this case the shock was mild. I agree with Warren⁴ when he states that "the greatest mis-

conception" exists as to the severity of the primary shock. Instead of being a prominent feature it is present only in a relatively small number of cases, and is then rarely pronounced. "Collapse with hypocratic facies, rapid pulse,"¹¹ etc., are not symptoms of the early stage.

4. *Vomiting* is a very constant symptom; it may occur at the onset as a reflex effect of the constriction of the bowel; and secondly, it occurs as a result of the obstruction to the fæcal current, and this usually begins a few hours after the onset. The higher the obstruction, the earlier the occurrence of vomiting. In one of my cases in which the proximal end of the ileum instead of the distal end was closed by mistake during the performance of an ileocolostomy, it did not occur till the fortieth hour. The use of morphia and lavage of the stomach temporarily stops vomiting.

Stercoraceous vomitus (a brownish dark foul smelling liquid) was noted in seven of these cases. It began on the fourth day in two cases, on the fifth day or later in the other five; only one out of these seven recovered. Treeves¹⁵ states that the time the vomiting becomes stercoraceous varies from the second to the ninth day, the average in a large number of cases being the fifth day. Greene¹⁶ says, "Fæcal vomiting may require twenty-four to forty-eight hours to develop fully its characteristic brownish colour and specific odour." In my cases fæcal vomiting in the correct meaning of the term did not occur once.

5. *Distension*. The time of onset of distension was recorded in twenty cases as follows: During the first day—three cases; during the second day—five cases; during the third day—seven cases; and on the fourth day and later—five cases. Treeves¹⁷ places the average time for the beginning of distension as the third day. Its appearance is delayed by active vomiting and by gastric lavage. My figures suggest the conclusion that it is found during the first day only in three types of cases: (1) in cases in which a large loop of bowel has become strangulated as in volvulus of the sigmoid, in which a local tympany appears; (2), where partial obstruction has preceded the complete; and (3), where local peritonitis has preceded the obstruction. In the two latter groups, some distension is commonly present prior to the onset of obstruction. It may be asserted that interruption to the onward passage of the bowel content, in itself, does not give rise to distension until after the lapse of at least twenty-four hours.

6. *The Pulse*. In twenty-two cases the character of the pulse during the first twenty-four hours was recorded, as normal in

eighteen, and accelerated in four cases. One of the four was the case of shock in a child. In the other three the obstruction was secondary to a peritonitis. On the second day in thirteen of the eighteen the pulse was still normal. It may be confidently taught that, except in the types of cases just noted, the pulse is usually normal during the early stage, and that a rapid feeble pulse is a symptom not of the obstruction itself but of its late complications—strangulation, gangrene and peritonitis.

A study of this series supports the opinion that in 75 per cent. of the cases of acute intestinal obstruction, the only symptoms present in the early stages are peristaltic pain, vomiting, and constipation.

These three symptoms (pain, vomiting, and constipation) should at once arouse a suspicion of obstruction, and the attending physician ought to take means to decide the point without delay. Laboratory tests and the use of the x-ray are not required for this purpose. The personal history may reveal previous peritonitis, poisoning by lead or the tyrotoxicon of stale milk or ice cream. A careful examination of the usual hernial sites is then made to exclude strangulated hernia. But most important of all is to determine whether or not constipation is absolute. An S.S. enema that will fill the colon (two to three quarts for an adult) is given, and the patient assisted to retain it for at least fifteen minutes by pressing the buttocks together. Some fæces and flatus may be expected to result from this enema even in cases of complete obstruction, and, if the patient had not had a bowel movement during the previous twenty-four hours, a large stool may result. A second enema is therefore necessary, and even a third may be advisable. If both second and third enemas are negative in results, a diagnosis of obstruction is warranted. Only after a diagnosis has been reached and the treatment required explained to the patient, should morphine be resorted to.

In conclusion, it may be emphasized:

(a) That stercoraceous vomiting, abdominal distension, rapid feeble pulse, and symptoms of collapse belong not to the early stage but to the late, moribund stage of intestinal obstruction.

(b) That a diagnosis to be of service to the patient must be made before the onset of these symptoms.

(c) That the three symptoms, peristaltic pain, vomiting and absolute constipation verified by the enema test justify a diagnosis of obstruction.

(d) That more definite teaching in the text-books used by students and practitioners regarding the clinical course is essential before we can expect earlier diagnosis to be made.

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THE IMPORTANCE OF BIOCHEMICAL TESTS IN PATIENTS SUFFERING FROM PROSTATIC ENLARGEMENT

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THAT biochemical tests have graduated from the physiological laboratory and are firmly established as an important adjunct of clinical work, is a fact that may be asserted without fear of criticism. To no department of medicine is their application more important than in that of urology, and particularly in patients suffering from prostatic enlargement is the biochemical laboratory a valuable addition to the armamentarium of the urologist.

It has long been recognized how important the functioning power of the kidneys is in the success or failure of prostatectomies. Long continued obstruction at the bladder neck with residual urine and increasing amount of back pressure on bladder, ureters, and kidneys sooner or later seriously damage the renal parenchyma, and permanently effects its power as a functioning organ. The ability of a patient to withstand such a serious operation as prostatectomy depends therefore to a great extent on the functioning power of the kidneys. If a patient with debilitated and poorly functioning kidneys is submitted to the further shock of a serious operation, the outcome may be dubious.

It follows therefore, that the estimation of combined renal function is most essential not merely from a prognostic point of view, but as a means of controlling the diet administered during the preliminary treatment, and of determining the best time for operation, and whether operation may even be performed.

Till recently, reliance has had to be placed on the test of excretion; albumin, casts, urea, etc. Misleading interpretations followed their use in many cases. The most useful of these is probably the phthalein test of Geraghty and Rowntree. The excretion of phthalein in a given time merely indicates, however, the amount of

Read at the fifty-first annual meeting of the Association, Vancouver, June, 1920.

work the kidney is doing at the moment and offers no information as to what waste products of metabolisms are being retained. It has been frequently noted by other observers that the phthalein test varies inversely as the concentration of the urea nitrogen in the blood. Our own examinations have corroborated this. Far more value is derived from tests of retention, particularly of urea nitrogen, creatinin, and uric acid in the blood. The amount of these substances in the blood indicates the balance between waste substances produced and those excreted by the kidneys. If the kidneys are lacking in functioning power there will be an accumulation of the waste products in the blood, with serious results, if the debit balance is not overcome.

One valuable method of estimating renal function is the renal test meal. This test covers a period of three days, during which the classical Mosenthal diet, containing known amounts of nitrogen, salt, and water, is administered. The first two days are allowed to enable the patient to come to an equilibrium, so that his previous dietary may have no influence. During the third twenty-four hours, specimens of urine are collected every two hours, from 8 a.m. to 8 p.m., and then the combined urine from 8 p.m. to 8 a.m. The individual specimens are compared as to amount, specific gravity, and concentration in nitrogen and salt. Impaired kidney function is shown either by:

- (a) Fixation either of specific gravity or volume, or both.
- (b) Nocturnal polyuria, that is, over 400 c.c., with a low concentration of nitrogen or salt, that is, under 1 per cent.
- (c) Retention of salt, water or nitrogen.

During the test, examinations of the blood may be made for various nitrogenous constituents including uric acid, urea and creatinin, and of the urine for phthalein excretion. The average normal amounts of these substances are, in terms of milligrams per 100 c.c., uric acid 1 to 3, urea nitrogen, 15 to 18, and creatinin 1 to 2.5, and for phthalein 60 to 80 per cent. in two hours.

Valuable conclusions as to the operability of the case may be drawn from these tests. Moreover, subsequent tests will give important information as to the effect of the preliminary treatment, which will consist in the relief of back pressure on the kidneys by regular catheterization, etc., and the administration of a diet, low in nitrogenous constituents. For example, it is of the utmost importance to know whether the excess of nitrogen in the blood is one wholly due to an organic lesion of the kidney or partly to the

mechanical obstruction of the enlarged prostate, the kidney being unable to excrete against this back pressure.

If the excess of blood nitrogen is one mainly due to mechanical back pressure, relief of the pressure will in all likelihood be followed by a reduction in the amount of blood nitrogen. If, however, this excess of blood nitrogen is not markedly lowered, it follows that there is chiefly an organic lesion of the kidneys, and attempts must be made by the use of an appropriate diet, especially low in nitrogen, to reduce the nitrogenous excess in the blood, within safe limits of operability.

One case admitted during the past year to the Urological Service of the Montreal General Hospital, suffering from complete retention, showed on admission blood urea nitrogen of 140 milligrams per 100 c.c. Regular catheterization was difficult, and an indwelling catheter was not tolerated. For these reasons a suprapubic operation for drainage was carried out under local anæsthesia. A bad prognosis was given. The patient gradually sank and died within seventy-two hours. Autopsy revealed small chronically inflamed kidneys with an acute cystitis and pyelitis. A case in the next bed with a similar condition who seemed to differ in no way clinically, showed on biochemical examination 22 milligrams per 100 c.c. of urea nitrogen in the blood. Operation was carried out with complete success.

Frequently, weekly observations have been made on several cases undergoing preliminary treatment for prostatectomy, operation not being deemed advisable on admission to hospital. During this time, back pressure has been relieved, and low protein diet administered.

D. M., age seventy, suffering from an extremely enlarged prostate, with complete retention, who showed on admission, May 13th, 1920, 75 milligrams of blood urea nitrogen per 100 c.c. and 4 per cent. of phthalein in two hours. The patient was regularly catheterized and placed on a low protein diet. Tests carried at weekly intervals showed the following:

	BLOOD UREA NITROGEN	Per Cent. Phthalein
May 24th	63 mgs.	11
June 2nd	42 "	16
June 16th	36 "	26

A. B., age seventy-four, admitted for prostatic enlargement, and a large vesical calculus, developed a hemiplegia on the night of

admission. His original kidney function on March 3rd, 1920, showed by the renal meal, a nocturnal polyuria with a low concentration for salt and nitrogen, a total polyuria (intake equalling output), and a fixation of specific gravity (maximum-minimum variation three points), phthalein output of 35 per cent. in two hours, and blood urea nitrogen of 74 milligrams per 100 c.c. He was placed on a low diet, and subsequent examination showed:

	BLOOD UREA NITROGEN
March 24th.....	35 mgs.
March 29th.....	21 "

At this period a suprapubic operation was performed, and a large calculus recovered. The next examination on April 3rd, 1920, showed a rise in blood urea nitrogen to 35. Subsequent examinations were as follows:

	BLOOD UREA NITROGEN
April 12th.....	24 mgs.
April 18th.....	27 "
May 18th.....	29 "
June 2nd.....	28 "

It will be seen from these figures that nitrogen concentration in the blood was brought to a constant level and within safe limits of operability, and on June 9th, 1920, an obstructing median lobe enlargement of the prostate was removed with satisfactory results to date.

The prognostic value of blood creatinin as pointed out by Myers has been corroborated in this hospital. Every case showing over 5 milligrams per 100 c.c. of creatinin in the blood terminated fatally within two months or less. It is our opinion, that the safe limits of operability as regards blood urea nitrogen, are within 50 milligrams or less per 100 c.c.

With reference to the attempt to express renal function in exact mathematical formulæ, such as those of Ambard and McLean, it has been shown in practice that errors may occur, and misleading conclusions may be drawn from their interpretation, and that the estimation of the blood urea, phthalein test and the Mosenthal renal test meal are more reliable and more useful in urological practice.

Biochemical tests play an important part in the preliminary treatment of prostatectomies, and the surgeon who fails to make use of them is deprived of an important aid in the elimination or improvement of bad risks.

The writer is deeply indebted to Dr. I. M. Rabinovitch, of the Department of Metabolism, Montreal General Hospital, not only for the interest and skill displayed in performing the tests referred to, but also for the very material assistance rendered in the preparation of this communication.

SURGICAL GYNÆCOLOGY

BY HENRY PARKER NEWMAN, A.M., M.D., F.A.C.S.

San Diego, California

IT may be said without fear of contradiction, that we owe to anæsthesia, asepsis and hæmostasis not only the immense advance in modern surgery and its greater possibilities, but, unfortunately, a tendency to loose methods and careless work.

This follows so naturally the comparative immunity which surgical patients now enjoy that we need to be constantly on guard against it.

With the patient on the operating table, anæsthetized, insensate as the raw material under the hand of the artisan, and protected from immediate danger by the latest safeguards against hæmorrhage, sepsis and shock, there is to some too great temptation to loiter over unessential details, to do unnecessary or ill advised work. Also, the favourable conditions under which we may operate to-day, make it easy to forget that, in handling organs or tissue of the body, we are dealing with living substances of different degrees of resisting power, and the success of our manœuvres depends quite largely upon the amount of delicacy, dexterity and expedition that we use. The least possible violence must be done to delicate structures if we are to approach ideal results. In work within the peritoneal cavity, for instance, it is not enough to do an anatomically correct operation for the removal of this or that lesion of the viscera. Too often after such work we find the patient suffering as much as before the operation. The adhesions, scar tissue, and distortions, that follow undue violence or careless work, are frequently as great a bugbear to the patient as the condition for which the operation was undertaken.

This is science over-reaching herself, for it goes without saying that the main object of all operative work is to benefit the patient. And particularly is this true of all plastic surgery where a life-and-death emergency does not exist as an excuse for hurried or bungling

Read at the fifty-first annual meeting of the Association, Vancouver, June 22nd, 1920.

work. Take, for example, simple divulsion and curettement of the non-puerperal uterus; we have all seen the most reprehensible work done here. Tearing, especially about the internal os in rapid divulsion, is the most unfortunate because close approximation of the torn surfaces and healing by primary union is practically impossible. The consequence is the formation of scar tissue about a circular orifice designed physiologically to soften, dilate and contract, not only during labour but at the menstrual period as well. Thus, a delicate and important function is irreparably impaired. Similar results follow bungling or ill advised use of the curette, especially within and about the internal os. Too vigorous or careless use of this instrument may not only result in perforation, but also in the most serious disturbance of the delicate function just mentioned. The resulting granulations and scar tissue, including, perhaps, the broad ligaments as well as the entire cervix, are practically beyond remedy, and not only seriously impair the cervical function, but at all times menace stricture with its pathological sequelæ.

Indeed, this entire subject of when and how to use the curette is so important and so pertinent to my subject that I could afford it more extended consideration, but as I wish to speak of other procedures I will only say by way of emphasis that I would judge an operator not so much by his hysterectomies and capital operations, as by how he does his curettements and minor plastic work.

But it is not my purpose, in a brief presentation of the subject, either to discuss the merits and accomplishments of the brilliant leaders, past and present, whose skill and judgement have brought honour to this department of medicine, or to deplore the mistakes that have been made in the name of surgical gynæcology by some enthusiasts whose place is not properly in gynæcology and to whom the science appears as a pseudo specialty.

It is enough to say in passing that not to know the relation of cause and effect in pelvic lesions, not to be familiar by long training with therapeutic probabilities, the anatomy, pathology and complex functional activities of this region, is to be disqualified by both reason and conscience for surgical undertakings on the organs involved.

While this is true of plastic or minor surgery where function is to be restored and normal contours and relations re-established, it has its special application in major surgery involving the radical removal of functioning organs, like the uterus, tubes and ovaries.

The ease and comparative safety with which such operations on the pelvic organs may be accomplished, has invited their far too

frequent removal in cases in which neither the symptomatology nor gravity of the condition would justify such procedure. Were surgery of such extent and involving the mutilation of the sexual system, to be commonly applied to the male organs, or were one called on to decide the matter in reference to his own family, the real importance of the subject would be apparent.

Then, too, we now question the formerly accepted opinion, that the female reproductive organs are of use to the human economy only in so far as they contribute to the perpetuation of the species, and that their removal involves nothing more serious than sterility to the individual deprived of them. Later studies are tending toward a wider view of the significance of organs which mark the fundamental distinction between sexes whose mental and physical characteristics diverge so radically.

The probability is strong that ovarian secretions, as yet unclassified, have a high relative importance in general metabolism, as significant as the rôle now attributed to the secretion of the so-called ductless glands. And aside from the subtler considerations of cell activities and the physical and psychic effects of interference with their established order, the removal of the gross mass of any organ is an acknowledgement in itself that we cannot meet the indications or cope with diseased conditions except by removing the affected structure. True, in many instances the only honest course is admission of this inadequacy of medical achievement, and prompt recourse to such means as we have, but it should be the steadfast aim of our science to promote prophylaxis, to popularize preventive measures, to preserve organs and restore function.

Beyond what may be called emergency measures, then, for the saving of life in malignant disease, acute septic or inflammatory involvement, hæmorrhage from extra-uterine pregnancy, and the removal of various neoplasms, the province of operative gynæcology should be to recognize what pelvic structures can be preserved and how they may be restored to their functional activity and made to conserve such vital energies as may depend on such function. Also, we should aim, even in extirpative surgery, to preserve, as far as possible, the rhythmical action of the pelvic diaphragm and its sustaining structures, as well as that of the pelvic floor, too often seriously injured through the results of injudicious methods. In some instances, an unrecognized trauma or an abrasion about the stump of the severed broad ligament, may not only give rise to a pernicious immobility with its dangers, but interfere with free circulation and cause passive congestion, blood stasis and con-

current evils. I regard the rhythmical action and mobility of the pelvic diaphragm as an important factor in the ultimate cure of the patient. The blood vessels in the pelvic tissue, being without valves, are dependent to a greater or less degree on the diaphragmatic action of the muscle groups of this region, and it is my practice to reunite as far as possible, the severed tissues of peritoneum, broad ligament and vaginal vault so as to insure their normal stability and relations.

Where plastic work is undertaken for the relief of chronic conditions we have fuller scope and ampler opportunity for needed reforms, and as a means of demonstration I shall refer briefly to some of the more frequent procedures.

TRACHELOPLASTY

The classical trachelorrhaphies are rarely, if ever, indicated to-day, except in recent injuries or tears of the cervix uteri. Two decades or more ago, Emmet himself conceded that his original operation for pathologic conditions following laceration had had its day, and suggested for it honourable retirement to a few well selected cases.

In recommending tracheloplasty as a substitute I claim for it that it best fills the requirements of plastic work. It requires the least preparatory and after-treatment; it exacts the least in the way of time and patience from patient and physician. It has a wide range of usefulness, being applicable in cases of laceration and erosion of the cervix, hypertrophy, elongation, stenosis, and deformities, cystic degenerations, neoplasms and all adventitious growths—except cancer, which demands radical removal. As its name implies, it is a plastic operation on the cervix, and it may embrace all degrees of work from the repair of a simple tear, having pathologic involvement, to the more extensive amputations or entire removal of the organ. Its technique is briefly as follows:

Technique. The patient being surgically prepared and placed in the lithotomy position, the cervix is drawn down with a vulsellum forceps, bringing the uterus well into view. The cervix is dilated and the uterus curetted if indications for curettage exist. These are, however, so nearly constant as to make it practically the rule. The blades of the bullet forceps or double tenaculum, with which the cervix is held, may be reversed and placed within the cervix so that their points are directed laterally from within outward, but I prefer to use a specially designed instrument by which

traction is made on the inner area of the cervix, leaving the anterior and the posterior walls free for making flaps. The cervix is now transfixed by a special knife and a clean cut made from above downward, first in the posterior lip. The anterior lip is transfixed in a similar manner about 1 or 1.5 cm. in front of the other and cut in the same way. The intervening plug of diseased tissue is now removed by a single cut or two of the curved scissors; the bullet forceps having been moved to a lower position to allow it. The flaps thus made will now fall together and inward so as to assume the appearance of a normal cervix, and will require only the simplest suturing to keep them in this position. The first suture is passed through the centre of the anterior flap, a centimeter or more from its cut edge, and brought out about 0.75 cm. within the cervical canal. Two parallel stitches are now placed at each angle of the cervical canal. Silkworm gut or catgut is the suture material commonly used, and the employment of a fixed needle and holder renders an otherwise difficult procedure quite easy. The posterior lip is treated in the same manner, expect that here it is easier to pass the sutures from within outward, while the reverse is true in sewing the anterior lip. Two sutures are now passed, as in trachelorrhaphy, through the outer angles of the wound, which gape slightly after the turning in of the flaps. For nice adjustment of the stitches, and for ease in removal, I am in the habit of treating them in this way; in tying the sutures, one end of each is left long, and these long ends are grouped by tying them together according to their location. The three anterior sutures form one group, the three posterior one group, and the two lateral sutures are tied together, a pair at each side, making four groups in all. A uterine tampon of iodoform gauze or wicking is now inserted by means of a forceps and tampon carrier, a projecting strand being attached to the vaginal gauze tampon in order that both may be removed without undue disturbance of the parts.

If no accessory operation is to be done, the usual perineal dressings are applied and the patient put to bed. The external genitals are bathed with antiseptic solution after micturition, but no douching or disturbance of the vagina is allowed until after twenty-four or forty-eight hours, when the entire tampon is removed and not replaced. Vaginal douches of 1 to 4,000 mercuric chlorid are then used twice daily. The sutures are removed at the end of two weeks, unless absorbable material is used, and the patient can be up.

The advantages of this method are, in brief, as follows:

1. Quickness and ease of operating by the knife here presented,

the manner of making the flaps transcending in certainty and safety the ordinary methods of excision.

2. The fact that clean, smooth-cut surfaces are obtained without haggling of tissues.

3. The easy approximation of flaps and the fact that all hæmorrhage beneath them is avoided by deep placing of sutures and compression of flaps. There is accurate approximation of mucous membrane to mucous membrane, thus avoiding granulating surfaces, formation of cicatrix and constricting of canal. The certainty of obtaining a permanently patulous canal and a well formed cervix with pronounced reduction of a hyperplastic uterus, and the simplicity of the after-treatment, are of themselves enough to recommend this method to careful operators.

OPERATIONS ON THE PELVIC FLOOR

In operating on the pelvic floor, the indications are to correct the pathology and restore function in the involved structures. In nearly all long-standing cases, we have not only the presence of hyperplastic and scar tissue with disturbed function of the parts, but atrophy of muscles, changed relations of the different organs, and often veritable hernias. It is now many years since I suggested a classification of hernias which should include, besides cephalic, thoracic and abdominal, the group comprising cystocele, urethrocele, rectocele and prolapse of uterus and vaginal walls, this group to be known as pelvic hernias. A hernia is a surgical disease and calls for surgical treatment, which term admits of wide interpretation and includes all mechanical means, from simple air-pressure and gravitation in postural treatment to the radical procedure of removal of the offending organs. The latter, however, is rarely necessary except for unusual pathologic conditions, or in advanced age, but colpoperineorrhaphy, a modification of the flap-splitting perineal section and restoring the fascia and muscular layers, is indicated whenever any considerable tear or a weakened pelvic floor exists.

COLPOPERINEORRHAPHY

Technique. It consists of a simple extension of the lateral perineal incision of Tait, deep into the vaginal sulci, so as to expose the torn and retracted ends of the levator ani and transverse perinei muscles, as well as their fascia. These, the proximal ends of the muscles and fascia, are then encircled with a curved needle carrying a strong silkworm-gut suture, threaded at both ends, which when

crossed and brought out through the skin on opposite sides, form a figure-of-eight suture. A second suture may be introduced in the same manner, about a centimetre distant, for further co-aptation and strengthening of the muscular floor. Before tying these sutures, a crown, or puckering-string suture is passed around the upper part of the wound, just along the under surface of the vaginal flap, approximating and shutting off the vaginal part of the wound.

With the parts now fully brought together, sutures tied, and their ends left long and fastened in one strand, to prevent their irritating or pricking the surrounding surface, the operation is complete, and it only remains to guard against contamination in the after-care. Should the sphincter ani muscle be torn or weakened, the same cuts that are made anteriorly at the sides of the vaginal orifice are made posteriorly at either side of the rectum, exposing the torn and retracted ends of the sphincter ani muscle. It is then easy to catch up their proximal ends, and bring them together just in front of the anus with the curved needle and silkworm-gut suture. The figure-of-eight will hardly be necessary in this instance, as the sutures are so superficial. Should rectocele or cystocele exist, the former is effectually taken care of by colpoperineorrhaphy; the latter may be entirely remedied, or in case there should be an amount of redundant tissue not taken up by operation, it is a simple matter to remove an elliptical or conical section of the vaginal mucous membrane and unite the edges by a purse-string or running catgut, or by the interrupted suture.

CORRECTING DISPLACEMENTS

With the pelvic floor intact, it is now highly important to correct any backward displacement of the uterus and adnexa. This should be accomplished by first removing the cause, and then securing proper support from beneath, aided by erect carriage, postural treatment, and shortening of the round ligaments. The last named procedure, when done externally through the inguinal canal or external inguinal ring, will effectually hold the fundus forward over the bladder, and prevent further tendency to prolapse or retrodisplacement. The operation given to the profession years ago, which I called in reference to its technique, the "direct method", is still applicable to such cases in which the uterus is movable, and in which there are no complications which require opening of the abdomen. If section is necessary for adhesions or other complications, the internal method is to be preferred. The

proceeding is simple in the extreme, and when properly executed should lead to no unpleasant consequence in subsequent labours. In uncomplicated cases, in which the direct method is chosen, I proceed as follows:

AUTHOR'S ROUND LIGAMENT OPERATION

Technique. Under full aseptic and antiseptic precautions, I begin by making an incision $1\frac{1}{2}$ inches or more in length, parallel with Poupart's ligament, and directly over the canal of Nuck, which is midway between the spine of the pubis and the anterior superior spinous process of the ilium. No dissections are necessary; this initial step exposing the glistening aponeurosis of the transversalis muscle. (In the subcutaneous fat, near the middle of the wound, will be found the epigastric vein, which may be ligated or picked up with artery forceps, cut across and used as a guide, lying as it does, directly over the canal of Nuck.) Through a single nick in the separated fibres of the aponeurosis, the blunt hook may now be passed into the canal, and the round ligament, which will be seen as a whitish, slightly flattened, cord-like structure, pulled out in less time than it takes to tell it. In a case in which the operator may not be confident of his ground, the identity of the ligament may be established by lengthening the incision so as to expose it along the canal in its entirety; or, if further confirmation is needed, an assistant should be directed to draw the uterus backward by the sound or finger (passed through the vagina), when the tension on the ligament can be seen or felt in the wound, and will sufficiently distinguish it from the surrounding tissues. When the ligament of one side is secured, proceed in like manner on the other, and, drawing on both ligaments, expose, in the canal of Nuck, a reflection of the peritoneum surrounding the ligaments like a gloved finger. This should be stripped back until the ligament can be drawn well out and the uterus anteverted. This gives a loop of ligament on either side about 4 inches in length, to be disposed of by stitching the proximal ends together, and anchoring them firmly to the aponeurosis and walls of the canal by buried animal sutures, care being exercised to avoid strangulation of the ligament, or disturbance of its nutrition. The wound is closed with one series of silkworm-gut sutures, made to include the walls of the canal, the aponeurosis of the external oblique and the superficial covering. Permanent dressings are applied, and are only removed in case of special indications. Patients are kept in bed two weeks or more, until firm union

of the incised structures has taken place, and precautions against over-exertion or straining of the parts are insisted on for as many months.

The advantages of this method of shortening the ligaments are as follows, and are mainly due to the situation of the incision:

1. The short time necessary to recognize and secure the ligaments does away with the risks of prolonged anæsthesia and the liability to wound or destroy their fibres in protracted search, which sometimes occurs in the original Alexander incision since at this point, where there are few or no diverging fibres, there should be absolutely no teasing of the tissues.

2. The force used in pulling out the ligament is brought to bear on it at its strongest point, and is in a direct line with its intra-abdominal course. This is in strong contrast to the old mode of pulling on its frayed terminal fibres at nearly a right angle with its inner and stronger portion, and over the sharp, resisting surface of the ring.

3. Aided by the sense of sight, and seizing the ligament above the inguinal canal, one feels sure that he is drawing on the abdominal portion of the ligament and not merely stretching its inguinal section.

4. Having avoided all teasing and bruising of tissues, with proper attention to aseptic measures, there should always be healing by first intention; draining is unnecessary, and the after-treatment is relatively simplified.

5. If the ligament is strong and fully developed, as in its upper portion, it can be more securely anchored and made fast to the surrounding tissues.

6. Hernia is guarded against by the deep sutures constricting the canal about the internal ring, insuring firm union where most needed.

7. The nerves, intercolumnar fibres, and tissues about the external ring are not interfered with in any way, and this effectually prevents those distressing sensations of tension and pain which frequently continued for sometime afterward, when the wound was situated lower down, as in the old operation.

GENERAL CONSIDERATIONS

In abdominal sections, too great attention cannot be paid to the matter of effective closure of the abdominal wound, to insure subsequent stability of the walls, for upon this depends much of

their retentive and supporting power. As I have emphasized earlier, proper carriage, postural treatment and physical exercises are essential to the permanent maintainance of there structure, and without this stability, the individual can never be said to be well.

Setting aside, then, those capital operations performed for conditions whose gravity admits of no discussion, the question of gynæcic surgery resolves itself into that of expediency and adequacy in cases of ordinary pathology. He who does not realize this will perhaps never know why he has so many failures with such good and time-honoured methods. It is because he has been content with doing something—a repair of the perineum, resection of an ovary, amputation of the cervix, stitching up of a fistulous opening—without calling on all his reserve of experienced judgment to weigh the individual indications. And this experienced judgment, which should aid him in making his diagnosis, deciding his treatment and determining his prognosis, is what constitutes the gynæcological aspect of his science. Just as the artisan, habituated to the work, sees in the worn or broken article given him to mend, the story of its accident or misuse, the fault in its construction or composition, and thereby is able to judge how far, and by what means, he can hope to restore its integrity and usefulness, so the operator, confronted with some pathologic condition, searches back in the life of the patient for the productive factors in childhood, childbirth, in puberty, and adds this history to his knowledge of the present habit and temperament of the patient, before undertaking measures for relief.

It is crude surgery to say on examination of the patient: "Here we have a torn perineum; we will proceed to repair by the most approved method of perineorrhaphy," or, "We have here a lacerated cervix,—indication—tracheloplasty." It would be gynæcic science to say: "This perineum has been torn for years, the accrued pathology has thrown out of gear a whole set of delicately balanced organs, producing local pathologic conditions more serious than the original lesion, and a resulting disturbance of function in the system generally. The woman is abnormal, invalid, unhealthy, and it is the secondary affections which have driven her to seek relief. We have here not only a bit of local surgery to do, but a general reconstruction of the individual. Our plastic work will not be finished with the hour's work of the knife; we must literally remould the individual.

If this seems fanciful, quixotic, think for a moment what is concerned in the profession of medical science. Toward each

patient the physician assumes the rôle of dictator, infallible in all that concerns bodily health, and in this age of complicated living when we have artificialized (as far as possible), all natural processes, is it not worth the best man's untiring study to attempt to reconcile nature with modern modes of life?

In dividing our profession into specialties, we have need of keeping intact the saving characteristic of the old family doctor, close personal association with his patients. This individual confidence and intimate trust is necessary to the specialist and consultant, and his work will be correspondingly valuable as he cultivates it. Disease in the human body has the power of compelling and absorbing the interest of the subject to an exclusive degree; nothing else, for the moment, is of the least importance, and the patient is ready to meet professional advances more than half way. It is a sufficiently weighty responsibility, and nowhere else more weighty or more significant than in the department of gynaecic surgery.

Those men who tried, some years back, to create a new specialty called "orificial surgery", founded their misguided zeal on one very tenable argument: that the orifices of the body are of extreme significance in the animal economy. It is vital to remember this in work on the pelvic outlet. In choosing an existing method, or attempting some original procedure, the function and uses of the tissues under consideration, must be kept in mind. On account of the continuous demand on these organs, the tireless bodily activity which culminates here, the complexity of the eliminative processes, the rich vascular and nerve supply, nowhere else is there such a complication of difficulties to enlist the skill of the operator.

There is another point of view from which the relative importance of pelvic surgery is vast. Work undertaken to correct defects or malformations in other parts of the body is mainly for cosmetic purposes, and while requiring skill and judgement, frequently touches the question of general health; whereas, in restorative operations on the pelvic organs, the correction of defects almost always means the re-establishment of function, and the restoring of muscular integrity. Much of the failure of pelvic work is due to the fact that this special difference is not taken into account, and operations are undertaken with the view simply of restoring surface conditions, as it were; witness the mere superficial skin union we find after some perineorrhaphies. In such cases, only the outer integuments are restored, and all the under fascia and muscular structures are left as they were, to continue their hopeless inadequacy and long train of evils already established in the patient. And it

is this sequence of evils which will call for aid, the initial lesion assuming secondary importance in the case.

MULTIPLE OPERATIONS

This brings another suggestion, and one to which I attach great importance: multiple operating at a single sitting. Instead of operating on the cervix, perineum, vagina, or other organ alone, according to the most apparent lesion, and then waiting for results, perhaps having to subject the patient to a tedious suite of surgical procedures, during which time she is under nervous tension, and the habit of invalidism grows on her to a desperate degree, it is my practice to do, at one and the same time, all the different operations which the pathological conditions justify: colpoperineorrhaphy, tracheloplasty, excision of tubes and ovaries, curettement, shortening of the round ligaments, rectal or urethral work. This, putting all parts at one and the same time into, as nearly as may be, normal anatomic relations, gives Nature the best possible opportunity to do what is required of her; practically the whole process of cure being in her hands, for surgery can only remove obstacles to her work.

From the patient's point of view the proposition is admirable. It requires but little longer convalescence to get up from a half a dozen simultaneous operations than from one, and then they are done, and there is nothing to do but get well. The operator, too, has everything to gain. He can assure his patient that she is now as nearly normal, structurally, as mechanical science can make her and that she has only to follow instructions and a rational course of life to return to her normal health.

Of course, it may be a long road to restored vigour, but it is materially shortened by this manner of operating. Parts that have been subjected to long disturbance of circulation, infiltration and connective tissue formation, have undergone changes which it takes time to overcome; functions that have been disordered for a long time are difficult to restore, and there may be atrophy from disuse and malnutrition which it will require the best efforts of Nature to remove.

CONCLUSIONS

The indications for major surgery of the pelvic organs are obvious. Given the present state of our therapeutic knowledge, the removal of organs from the human body is a confession of our limitations. We remove them because, up to the present, we

know of no other way to prevent or correct the pathologic conditions which face us, but we are in duty bound to relegate such radical procedures to the domain of emergency work which justifies itself only in extremity. As for plastic gynæcic surgery there are practically no limitations, when it is determined that the local defects interfere with nutrition and circulation in the genital organs, thus giving rise to disturbance of function and tending to organic disease.

In the choice of methods, one is not limited to original devising. The operator has an extended programme already mapped out for him, but he will do the best work, nevertheless, who can select intelligently and adapt skilfully the operation to the patient and not the patient to the operation.

Case Report

A CASE OF MYXŒDEMA

BY A. T. MATHERS, M.D.

Director Psychopathic Hospital, Winnipeg

THE following clinical report of a case of myxœdema in an adult is interesting from several standpoints. The chief points of interest were the presence of a psychosis; the demonstration by x-ray of a remarkable atony of the gastro-intestinal musculature and the complete disappearance of both mental and visceral disorder under treatment.

Mrs. S., age thirty-two, wife of a soldier, was first seen in the Winnipeg General Hospital in September, 1919. At that time she was noted as being of slight build, somewhat emaciated and the skin anæmic with a yellowish tinge. She was somewhat indifferent at the time of the examination but was quite accessible and it was possible to get a fairly complete account from her of her difficulties.

Orientation was correct in all fields. Memory seemed to be in a very fair state of preservation and the patient was able to give a detailed account of her family and personal history although it was noted that mental processes seemed slow.

There is nothing of note in the family history. Patient herself as born on a farm in western Canada and had never been out of the country. Her infancy and childhood were normal. Early in life she had typhoid fever. Her education was apparently elementary but her retention of school knowledge was good. Economic history was not significant. Patient related that occasionally she was subject to blue spells. She was not particularly seclusive but had been exceedingly lonely and at times discouraged and despondent during her husband's absence overseas.

The history of the present difficulties shows that she began to feel nervous shortly before her husband left for overseas and at the time of his being warned for a draft in April, 1916, she had a nervous breakdown. This was evidently a minor affair as she was

only in the hospital for two or three days, the chief factor in her recovery being possibly the fact that the husband's departure was postponed for two months.

Following his leaving for overseas she had bouts of depression and of loneliness which she tried to dissipate by close attention to her household duties. Her husband returned in December, 1916, and they took up quarters in a double house. For six months she lived on good terms with her neighbour, then she began to hear conversations going on through the wall and developed ideas that her neighbour's children were not fit companions for her children. This continued and gradually she developed definite auditory hallucinations. She heard her neighbour talking very disparagingly about her and ascribed her hallucinations to telepathy or at least "some kind of spiritualism". The content of the hallucinations was largely made up of disparaging statements and accusations of immorality and cruelty to animals. The hallucinations and subsequent delusions became so troublesome, finally that she started out to look for some of the men with whom she believed she was accused of immoral conduct; this expedition resulted in her being sent to the Winnipeg General Hospital. Before her examination in the hospital was complete and a definite decision arrived at, she took "french leave" from the hospital.

It was felt that in all probability she was a case of paranoid dementia præcox—at that time the possibility of myxœdema being a factor was overlooked.

Patient was admitted to the Psychopathic Hospital on January, 9th, 1920. At that time she seemed very weak, was anæmic and there was a very definite yellowish tinge to the skin. It also was dry. The hair was dry and of a very fine texture, resembling fur rather than hair. The nails were well formed but brittle. In the region of the eyes and across the bridge of the nose there was the appearance of a definite œdema resembling rather closely the œdema that one occasionally sees accompanying certain forms of sinus disease. Both physical and mental processes were much slower than normal.

Mental examination showed that the hallucinations were still very evident and that delusions of persecution were prominent. She not only believed that her neighbours were saying evil things about her but that one of them who was particularly evilly disposed had cut up a weasel and put it in her soup, that she had swallowed it and that in some way or other the weasel had become whole

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PLATE I.

A twenty-four hour plate following a barium meal. There is definite evidence of atony of the gastro intestinal musculature—the walls of the bowel are ballooned and seem thin.

THE CANADIAN MEDICAL

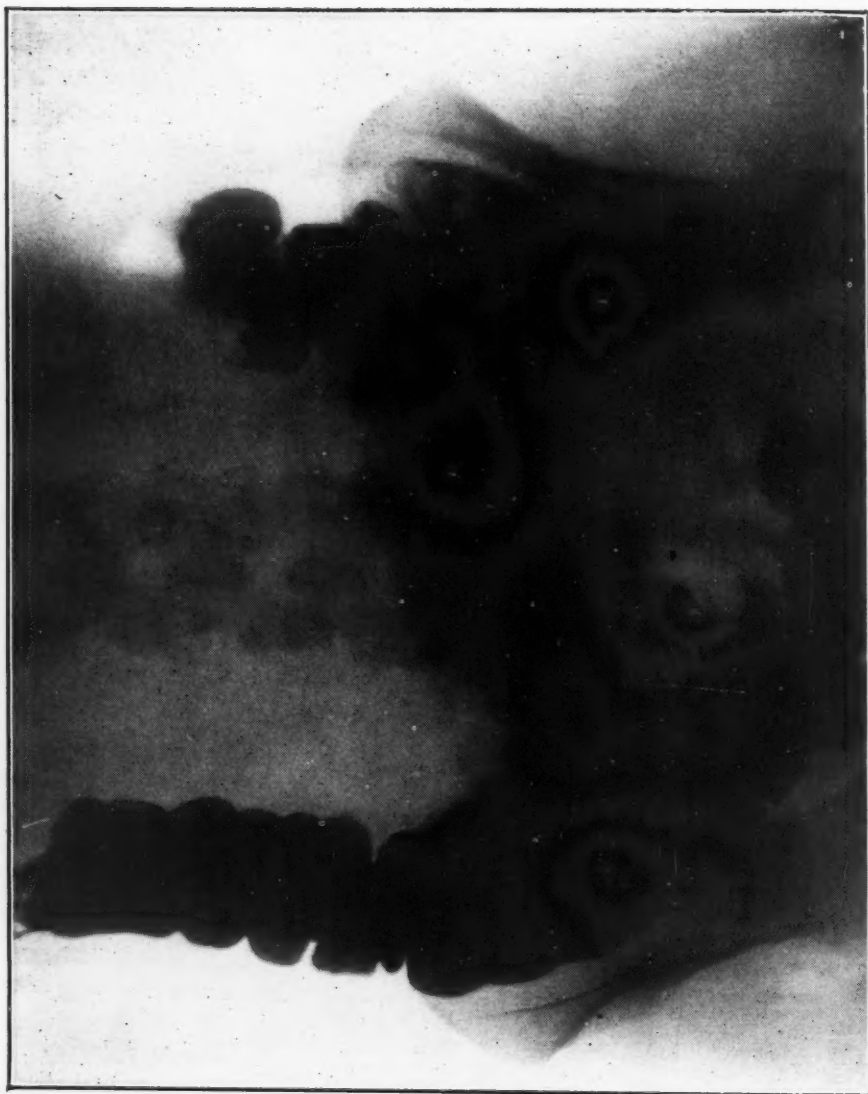


PLATE II.

A twenty-four hour plate following a barium meal. The appearance is that of a normal gastro intestinal tract.

again and she describes its activities in her stomach as very distressing to her.

Neurological examination was practically negative except that all reflexes were very sluggish. Wassermann reaction on blood and spinal fluid was negative. Blood examination showed a fairly severe degree of secondary anæmia with practically no change from the normal in the leucocyte count. The blood chemistry showed a low reading in both urea and creatinin. Von Pirquet reaction was negative. Urinalysis was persistently negative except that specific gravity was rather low.

Special examination of the nose and throat was negative.

Bearing in mind the result of Southard's investigation of somatic delusions, namely, that these were frequently based on some actual abnormality present, a gastro-intestinal x-ray series was done. This showed a remarkable degree of atony and stasis throughout the whole tract. By this time it seemed evident enough that the case was one of myxedema and in view of the remarkable x-ray findings one remembered the theory that the thyroid is supposed to have something to do with activating the abdominal vagus. The patient was at once placed on thyroid extract—two grains three times a day—and within thirty six hours a definite change was noted. She seemed brighter and was interested in occupational work on the ward. She never once mentioned from that time on the idea that there was something alive inside of her. She became very bright and happy; her appetite improved to a remarkable extent; she was noted by her nurse as being interested in everything. It was but a short time until she was able to laugh heartily about what she called "her crazy ideas". The thyroid was gradually increased and when she had made what seemed to be considerable improvement a second gastro-intestinal series was done. It showed as was anticipated, the complete disappearance of the abdominal gastro-intestinal stasis and atony. The accompanying reproductions of the twenty-four hour plates of the second series show a remarkable change in the condition of the gastro-intestinal musculature very clearly. In the first there is noted the marked atony and dilatation of the colon, and, as a matter of fact, the radiologist remarked when he saw this plate that the only condition he knew of that produced such appearance was multiple abdominal adhesion, and that in all probability the woman had tuberculous peritonitis. The second plate shows a practically normal colonic picture. One should have noted before that one could not by palpation detect any evidence of the presence of a thyroid gland although it seems

from the history that it is unlikely that there was complete absence and much more likely severe atrophy of the organ.

Comment. In this case we have clearly demonstrated the genesis of a psychosis dependent on thyroid insufficiency and its complete disappearance under the administration of thyroid per ora. We were also able to demonstrate the remarkable gastrointestinal atony which also disappeared under treatment. There is very little mention in any of the literature on the subject of this latter condition. McCarrison notes that "there is frequently a state of enfeebled digestion; impaired peristalsis and imperfect drainage of the bowel".

The contention that the secretion of the thyroid has an activating influence on the abdominal vagus would seem to be borne out by the results in this case.

Editorial

ON THE CHANGES IN THE CLINICAL TYPES OF INFECTIOUS DISEASE

SYDENHAM more than two centuries ago pointed out that many acute diseases appeared to have a long period of evolution with a rise and decline which might extend over centuries, and also seasonal variations in which their character and their reaction to treatment varied over periods sometimes measured in months, at other times in years. To explain these variations he considered that special influences, telluric or climatic, became dominant and impressed peculiar features on the clinical manifestations of the diseases prevalent at the time.

Since his time many writers have disputed his observations and denied that any change does take place except possibly in the mental outlook of the observers.

At present, however, no one doubts that certain of the infectious diseases have within recent years shown definite changes of type. Scarlet fever is universally recognized to have become milder, though its prevalence appears to have in no way lessened. This statement appears also to hold true of small pox, measles and diphtheria, while others have become more malignant, such as poliomyelitis, influenza and, perhaps, pneumonia.

The causes which may bring about these changes in type were discussed in a recent address by Sir Humphrey Rolleston at the New Orleans meeting of the American Medical Association. It is obvious he says that differences in the type of disease met with may be due on the one hand to a difference in the virulence of the infecting agent, and on the other hand to

an altered power of resistance to infection on the part of the patient. A highly virulent form of the infective agent acting on a susceptible individual with lowered resistance, will tend to produce a fulminating attack, whereas an attenuated virus acting on an individual with good resistance will give rise to an abortive attack, while at the same time it confers immunity. The difficult question to answer is whether or not bacteriology and changes in the resistance of the race, the result of environment, or of previous disease, or of other factors, satisfactorily explains these alterations in the clinical types of disease, or whether there is some further and mysterious factor such as is implied by some epidemiologists which has yet to be thoroughly elucidated.

We know that bacteria may vary in their pathogenicity as the result of external influences of various kinds. It has also been suggested that micro-organisms may have cycles of infective activity following periods of rest, and it is probable that epidemics occur during the periods when the infective activity is at the highest. The influenza virus, we are told, appears to have a cycle of thirty-three weeks, and the various strains of the infective agent of measles cycles of eighty-seven, ninety-eight, and one hundred and ten weeks. Furthermore, the same specific organism may give rise to clinical features varying in character and attacking different tissues in the body. Such variations may eventually be explained by the existence of some additional factor, such as an ultra microscopic organism, or by the presence of enzymes associated with the bacteria.

Another bacteriologic explanation for a change in the clinical type of disease is given by the differing strains of the infecting organisms. The various types of the typhoid bacillus are now well recognized. In cerebro-spinal fever several allied infecting forms have recently been differentiated to which variations in the clinical symptoms of the disease may be attributed. A similar statement may be made of the various types of pneumococci, and also of the bacillus dysenteriae, and perhaps also of the bacillus of whooping-cough. The occur-

rence of secondary infections, such as the pneumococcus and the streptococcus hæmolyticus in measles and influenza must now be recognized as a powerful factor in changing the type of an attack. Attention must also be given to the suggestive work of Vaughan and his collaborators on an immunity apparently conveyed by common infections, especially those of the respiratory system against other infections.

The resistance of individuals and races on the other hand is obviously influenced by environment such as over-crowding, over-work, bad or deficient food and alcoholism, and thus both the incidence and the severity of the symptoms become increased.

It is, however, often difficult to differentiate between the effect of improved hygienic conditions on the one hand, and of a diminution of the virulence of the infecting organism on the other. Thus the disappearance of typhus from Glasgow and other towns was attributed to improvement in the living conditions, but about the same time it disappeared from the Highlands and from Ireland where the sanitary conditions were little altered. In connection with these statements of Sir Humphrey Rolleston, we would call attention to the reappearance in England of a fatal type of small pox, which first invaded France from North Africa, and from Paris was introduced into London. A note in a recent number of the *British Medical Journal* compares this severe type with the mild type which has for some time been prevalent in America, and was a few years ago introduced into England. That they are both types of the same disease is shown by the fact that vaccination protects equally against both. Dr. McVail in discussing the co-existence of these two types asks, "are we to explain the greater severity of the African form in terms of local conditions operating upon individuals with lowered resistance, or is it a resultant of some factors directly modifying the *materies morbi*?" The question is one demanding careful research. If the difference in type is due merely to a lowered state of bodily resistance, the appalling

conditions at present existing in eastern Europe give grounds for apprehension that a greatly increased virulence in many forms of disease may have to be reckoned with in the near future.

THE ADDRESS IN SURGERY

WE have much pleasure in directing the attention of our readers to the very interesting address in surgery delivered by Dr. Archibald at the recent annual meeting of the Association in Vancouver. Every physician recognizes how seriously foci of infection in the intestine may impair the general nutrition of patients suffering from pulmonary tuberculosis; the loss of appetite, the discomfort and frequent pains in the abdomen, and the troublesome and more or less rest-disturbing diarrhoea lower the strength and vitality of such patients very rapidly. Dr. Archibald has attempted by surgical methods to remove this source of irritation by either complete resection of the infected portion of the bowel, or by short circuiting, thus securing absolute rest for it. He states that provided the diagnosis of the intestinal infection is made sufficiently early and the pulmonary lesion is not too far advanced satisfactory results can be obtained in the great majority of cases.

Dr. Archibald discards the old pathological view that infection of the intestinal wall takes place as the result of deep local penetration by bacilli in the ingested food, and accepts the modern view that in every case infection is carried by the blood stream. The bacilli appear entering the intestinal wall to be carried through the thoracic duct into the pulmonary and general circulation. The intestinal infection is always a sequence to, as well as a complication of the pulmonary infection. The foci of infection, however, are rarely distributed throughout the length of the intestine, but are confined to that portion of the intestinal wall supplied by the artery through which the infecting organism has happened to

have been carried. Surgical interference for this reason is possible. An early diagnosis, however, is essential if surgery is to accomplish anything. With the appearance of the classical text-book symptoms, diarrhoea, nausea, pain, irregular pyrexia and progressive wasting operation becomes contraindicated. Dr. Archibald therefore emphasizes the statement that in all cases of pulmonary tuberculosis the onset of digestive derangements with pain localized in the middle or lower portion of the abdomen, transient but recurring, and generally aggravated by taking food, demands the careful investigation by the physician, and in certain cases an examination of the motility of the various sections of the bowel by the *x*-ray. Especially valuable is such an examination when some portion of the large bowel is involved, in which much more than in the small intestine, the great hyper-motility of the affected part can be easily recognized.

When intestinal infection is recognized early and when the disease in the lung is not too extensive nor too acutely progressive, excellent results may be anticipated from careful surgical interference. In Dr. Archibald's sixty cases the operation appeared to prolong life and greatly increase its comfort. In four cases, however, death occurred and was due to an atonic obstruction of the bowel developing a few days after operation. Dr. Archibald in concluding the presentation of his methods and results says, that while owing to the very nature of the disease, victims of intestinal tuberculosis who consult the surgeon are also victims of pulmonary tuberculosis, and operative measures therefore are seriously handicapped from the outset, nevertheless the relief obtained from distressing symptoms has been so considerable as to justify the operation in those in whom the pulmonary lesion is not so far advanced as to be hopeless.

THE ADDRESS IN MEDICINE

IT is an interesting fact that the modern tendencies in the teaching of medicine are to establish the functional capacities of organs and tissues—rather than the study in too much detail the anatomical and structural peculiarities, at all events function is being “featured” to the extent that in diseases of kidneys and heart for example, we are more apt to ask “what can this organ do?”, “What is it capable of?” than “What is the structural change?” Thus in diseases of the heart we are more concerned with the functional ability of the organ to carry on, than with the exact nature of the organic lesion that is present. In other words we are curious as to the power of the muscle, rather than the origin of the valvular defect or the propagation of a murmur, and with this objective in diagnosis we find that the subjective symptoms are indeed of paramount importance. Dr. Greene in his address in medicine (q.v.) delivered at Vancouver lays stress on the need of a more rational and modern conception of cardiopaths and warns against following traditions that have lingered through the decades. We must realize the need of early diagnosis of cardiac lesions, chiefly myocardial lesions that constantly occur through very light causes (mild infections etc.) and develop so gradually and imperceptibly that they impair function and shorten life, before the fact is appreciated.

Emphasis is laid upon the subjective symptoms, upon the need of proper physical examination to determine wherein lies the normal and what are its limits. Much of the contribution is devoted to a description on the congenital-asthenics in whom inadequate myocardial reserve is an outstanding feature. To this class belong many of the psycho-neurotics of the war, the soldiers who could not carry on after short training and broke down.

The address will engage the interest of every practitioner

as affording an excellent opportunity to grasp the problem of approach to the modern study of the cardiopath.

THE ALKALOIDAL PRINCIPLES IN PLANTS

RECENT investigations on the active alkaloidal principles of plants indicate that they exist in largest amount in that part of the plant in which protein metabolism is greatest at the time. They appear to be built up from ammonia formed in the plant by the decomposition of amides. In this respect they resemble the formation of urea in animals and are to be regarded as simply waste products of the plant metabolism, stored up because there is no means for their elimination.

The view that they are to be regarded as organic reserve materials devoted like fats and carbohydrates to the growth and development of the plant, has been shown recently to be an error. The same statement is applicable to the glucosides of digitalis. In the Pharmacological Institute at Freiburg in Baden, the glucosides present in the digitalis seeds were found not to decrease in amount as do the fats when germination takes place, but to pass into the leaves of the seedling without loss in quantity; the content of the digitalis glucosides were found also to increase up to a certain stage, corresponding to the amount of the protein metabolism taking place in the leaves.

In the cultivation of these medicinal plants it is of interest also to note that the alkaloidal content of the plant appears to be much influenced by the addition of special chemical fertilizers to the soil, but the exact nature of the fertilizing agent to be used must be determined by experiment. In experimental work carried on under the supervision of Dr T. P. Shaw near Orford Lake, it was found that a soil rich in lime produces plants of the belladonna group yielding a higher per cent. alkaloidal content when fertilized with nitrate, than when fertilized with phosphates, ashes or other fertilizing agents.

Retrospect

SUBACUTE INFECTIVE ENDOCARDITIS

By F. R. BROWN, B.A., M.D.

Montreal General Hospital

LAMB, A. R: "Non-Hæmolytic Streptococcus Endocarditis." *Med. Clin. North Am.*, vol. ii, January, 1919, p. 1027

DEBRE, R: "L'Endocardite Maligne à Evolution Lente." *Revue de Medecine*, 2, 3, 4, 5, 1919.

LIBMAN, E: "Some General Considerations concerning Affections of the Valves of the Heart" *Med. Clin. North Amer.*, vol. i, 1917, p. 573.

KINSELLA, R. A: *Arch. Int. Med.*, vol. xix, 1917, p. 367.

WHILE this disease may occur in children and in people past middle age it is a disease pre-eminently of young adults, and of females more than of males. Practically every case is engrafted upon a pre-existing chronic cardiac valvular disease usually of rheumatic origin. This is an essential background for the diagnosis.

The onset is as insidious as the disease itself. Usually over a period of weeks the patient will complain of a vague malaise, of more or less severe articular pains, of irregular, mildly febrile attacks. There is progressive loss of weight and a slowly developing anæmia. As the disease progresses there is an aggravation of the initial symptoms, and the characteristic symptoms and signs on which the diagnosis is to be based, appear. The most frequent of these are: cutaneous eruptions—petechiæ; transient painful erythematous nodules; arthropathies; splenomegaly.

Arthropathies. These frequently recall the symptoms of rheumatic fever. They coincide with an accentuation of the fever, and may recur several times during the course of the disease. The effusion into the joint cavities is serous, never purulent. The same organism as that found in the blood stream may be isolated from this exudate. Muscle pains may exist independently, or may accompany the joint symptoms. These frequently take the

form of severe cramps. There may also be painful areas over the long bones. Libman draws attention to the frequency with which one may elicit tenderness over the sternum in this disease.

Cutaneous eruptions. Petechiæ. These are most important and there are few cases in which they do not appear at some time in the course of the disease. They are more often found on the lower extremities, but may be found on the trunk and face. The petechial eruption is rarely confluent.

Transient painful erythematous nodules. These constitute a pathognomonic sign. They appear as small swollen areas, from five to fifteen millimetres in diameter, raised, purplish blue except the tip which is white. They come on suddenly and are usually quite painful, but they may be numb, prickly or cold. They clear up usually in a few days. They are in the skin, not under it, and resemble somewhat, a simple urticarial papule. The more frequent sites for these nodules are the ends of the fingers and of the toes, and the thenar and hypothenar eminences.

Pigmentation. Libman has drawn attention to the peculiar café-au-lait colour which these patients often present. It is usually localized to the face. The mucous membranes are not affected.

Splenomegaly. This is an almost constant sign, due largely to successive infarct formation. The history will usually contain references to recurrent pain in the upper left quadrant, especially at the times when the patient noticed that his general condition was poorer than ordinarily. Hepatic infarcts are much rarer than splenic, and an enlarged liver is of much less diagnostic value than an enlarged spleen.

A very diverse symptomatology resultant from emboli is encountered in different cases. Embolism of the mesenteric vessels with its train of symptoms is very apt to be misleading and to be interpreted as requiring surgical interference. Renal infarcts are common. A subacute nephritis, with slight hematuria is frequently found. As a rule there is very little disturbance of the respiratory apparatus. However, pulmonary infarcts and pleurisy do occur. Cerebral emboli are not uncommon and are frequently the cause of death.

Debre lays very great stress on the frequency of aneurisms in this condition. It is characteristic of them that they develop rapidly and are frequently multiple. They are rare in the aorta, but common in the cerebral vessels where their rupture is a frequent cause of death.

Retinal hæmorrhages are frequent enough to be deserving of

mention. Gangrene and ischemia are the result, as one would expect, of complete or incomplete obliteration by emboli of the larger vessels.

The Blood. Anæmia is an essential symptom. It is progressive and has led to mistaken diagnoses of leukæmia and chronic hæmolytic anæmia of the Addison-Biermer type. With the reduction of the red blood cells there is usually a slight leukocytosis with moderate increase of the polymorphonuclears. Occasional myelocytes may be found. Blood culture is practically a *sine qua non* in the diagnosis. It may be necessary to repeat this several times before obtaining a positive culture. When positive it should be confirmed by a subsequent culture. Naturally positive cultures are more frequently obtained during the periods of exacerbation of the condition, as shown by increased pyrexia, malaise, petechiæ, etc. It is well to remember that the colonies develop slowly, frequently not appearing before the eighth day.

The consensus of opinion is that in this condition the organism is a non-hæmolytic streptococcus. The streptococcus viridans has been recovered in a large proportion of the cases. For a complete discussion of the bacteriological studies which have been made in this connection, the reader is referred to the various articles by Libman, Schottmüller and Debré.

The Heart. In subacute infective endocarditis the myocardium is very little involved, the pericardium is rarely affected and the patients suffer very little cardiac distress. Functional disturbances are inconstant and when they do exist they are usually mild.

The vegetations which develop on the endocardium are engrafted on old valvular lesions. They increase slowly and are accompanied neither by ulceration nor by necrosis.

The auscultatory signs, determined at the first examination, are often very little modified during long periods. Still at some time in the evolution of the disease the stethoscope will reveal modifications in the signs. One should search for them carefully, remembering that the cardiac lesions found at autopsy are always graver and more complex than the clinical manifestations would have led one to anticipate.

Dyspnoea is one of the disturbances met with. It is usually slight and only manifests itself after exertion. Præcordial pain is rare and seldom severe enough to indicate morphia. Palpitation may at times prove troublesome. Tachycardia is fairly frequent and is of importance. Its persistence during periods of relative apyrexia is of value in the diagnosis. It draws attention to the heart and to

the possibility of an active process. The discrepancy between a slightly elevated temperature and an abnormally rapid pulse must be carefully considered. However, it is exceptional that these patients die of "cardiac accidents".

It is impossible in this short résumé to enter into the pathological anatomy of the condition.

To recapitulate. From the start the alteration in the general condition is marked, and appears disproportionate to the signs which one can elicit. Fatigue, depression, a profound malaise and especially anæmia are manifest before any localizing symptoms are evident. The patients lose weight as a rule from the start. However, some may show pallor, weakness, elevation of temperature and at the same time very little change in body weight. On the other hand, when the disease is well established there appears to be an inversed disproportion between the general condition and the gravity of the patient's condition. In spite of multiple emboli, in spite of considerable elevation of temperature, in spite of positive blood cultures, the general condition appears relatively good. It presents, however, variations which correspond to the characteristic phases of exacerbation and remission of the disease. The progress of the disease is irregular and long drawn out. At times the fever rises and it is then that appear the cutaneous eruptions, the retinal hæmorrhages, that the joints and periarticular tissues become involved, that the cardiac signs may be modified, that the splenic, hepatic and renal infarctions occur, and that the cerebral emboli take place. It is during this phase that the organism is most readily obtained from the circulating blood. Then after a variable time the temperature lowers, the patient feels better, the cutaneous eruptions cease, the joints become less painful, hematuria and albuminuria diminish. This temporary improvement is very apt to give rise to false hopes. The appetite improves, insomnia is less marked, and the patient is likely to request that he be allowed up. After a varying length of time another relapse sets in with a repetition of the above-mentioned phenomena. These periods of remission and exacerbation alternate thus for several months. In general towards the end the periods of remission become more and more rare and of shorter duration, and in the last stages the sthania, adynamia and anæmia are pronounced. In spite of the gravity of the situation, if no cerebral lesions have occurred, consciousness may be retained and even a certain optimism. After a period of six to twenty-four months, death intervenes.

The prognosis is about as insidiously fatal as any disease can

be. Libman reports three recoveries out of a total of over two hundred and fifty cases. Certainly recovery is so rare we must consider the disease as practically uniformly fatal. It is rare that the patient succumbs simply to the infection. It weakens and may produce a veritable cachexia, but it only brings about death indirectly. Thus a pneumonia may terminate the condition, but the most important direct causes of death are the vascular complications. As a rule death results from emboli or from rupture of an aneurism. Thus in the prognosis to the family it is important to inform them of the probabilities.

Treatment includes all the measures known to build up the patient's general condition. As anæmia plays quite a considerable part in the downward path, repeated transfusions usually of about three hundred c.c., undoubtedly prolong life. It is often necessary to treat the family to keep the patient from being tampered with by useless endeavours. Autogenous vaccines have been used but have done absolutely no good. Thayer states that sera and vaccines where streptococcus viridans is found, usually do harm. His final remarks on the treatment of this disease, are, "nil nocere".

The Association

THE VANCOUVER MEETING

THE fifty-first annual meeting of the Association held at Vancouver June 22nd to 25th, will go on record as one of the most successful in its history. Much was expected of the West, and it is safe to say that the expectations of the most sanguine were realized. Over six hundred attended, the great majority, of course, coming from points west of Winnipeg. But at the same time there was a very fair representation from the East. Ontario sent fifty-six, Quebec seventeen, while from the provinces of the extreme East, four were registered. It is worthy of note that upwards of one hundred attended from across the border. We are always glad to welcome our United States confrères, and note with pleasure that many of those present contributed to the programme, and took part in the scientific discussions.

The programme was a splendid one; the addresses being of especial merit, and the papers given in the different sections also of high standard. The local Committee is to be congratulated upon the general excellence of the programme as well as on the arrangements made for the work of the various sections. It is to be regretted, however, that no adequate arrangements were made for the general business sessions of the Association, particularly on account of the fact that many important matters were brought up for consideration. It is always desirable to have a large attendance at the business meetings, but unless a special time is set aside on the programme it can hardly be expected that the members will attend in large numbers.

Amongst the important items of business considered were the revision of the Constitution and By-laws; the general re-organization of the Association on a more business-like basis; the proposal to form a Canadian College of Physicians and Surgeons, and the organization of the profession in its relation to the Workmen's Compensation Act. Reference to certain of these questions together with resolutions and committee reports will be found in this number.

In connection with the re-organization of the Association a strong Committee, having representation from each province, was appointed, and was requested to submit a report at the next annual meeting at Halifax. The opinion was expressed that our

Association does not now rest on a sound and permanent basis and that we have not the co-operation and support of all the provincial and local organizations. It is expected that the Committee's report will contain some suggestions which will lead to the development of a larger measure of support from these organizations than we have had in the past. It was also suggested that certain changes be made in the general appearance of the Journal. Many of the modern medical journals have adopted a larger size, and it was felt that it would be of advantage in many ways to publish a Journal having the same general appearance as the *Journal of the American Medical Association*. This question will also be taken up by the Committee on Re-organization.

Invitations for next year's meeting were received from London, Ont., Halifax, N.S., and Niagara Falls, Ont. The Council, after careful consideration, recommended that Halifax be chosen and this met with the unanimous approval of the general assembly. The decision of the Council was influenced by the fact that Halifax had sent an invitation for the meeting of 1919, but gave way to Quebec. Dr. Murdoch Chisholm of Halifax was elected president, and we feel sure that he will make the Halifax meeting as successful as the one just closed.

We cannot close our report without mentioning the excellent arrangements made by the local Committee for entertaining the visitors. The members of the profession and many other prominent citizens of Vancouver united to make our stay in the city a most enjoyable one. Regret was expressed by many that the business and scientific work of the meeting took up so much of the time that little opportunity was left to visit the various points of interest in the city and surrounding country.

RESOLUTIONS ADOPTED AT THE ANNUAL MEETING OF THE ASSOCIATION AT VANCOUVER, JUNE, 1920

On Formation of Canadian College of Physicians and Surgeons

Resolved. "That the President be authorized to name a special committee representing the various provinces, with Dr. H. A. MacCallum of London, Ontario, as chairman, to investigate and bring in a report at the next annual meeting, and that the original resolution be referred at once to each Provincial Medical Association, and to each University in Canada, for consideration, and that they

be requested to forward an expression of their opinion in the matter to the chairman of the committee at the earliest possible date."

The following committee was appointed by the President:

Drs. H. A. MacCallum, London; S. E. Moore, Regina; F. W. Marlow, Toronto; A. E. Garrow, Montreal; James McKenty, Winnipeg.

Approval of Medical Council of Canada

Resolved. "That in as much as the Canadian Medical Association is the unifying influence in the medical profession of Canada, be it resolved that the Canadian Medical Association approves of the Medical Council of Canada, its aims, objects, and aspirations, and would urge upon its members the desirability of securing its license."

On Standardization of Drugs

Resolved. "That a Committee be appointed by the Canadian Medical Association to consider the question of standardization of drugs in Canada."

On Workmen's Compensation Act and Organization of Profession

The following resolution is offered by the Round Table Conference assembled on Tuesday, June 22nd, to the Canadian Medical Association.

Resolved. "That a special Committee of this Association be appointed at this Annual Meeting composed of three members from each Province, for the following purposes:

1. To collect data and all other information from the respective provinces in reference to the operation of the Workmen's Compensation Act, Insurance Fees, Lodge and Contract Practice, etc., and to make suggestions and recommendations to this Association as they deem advisable at this time or at any future date, and to further supply Provincial Organizations when called upon, with such data, assistance and recommendations as may seem fit.

2. To collect data and such other information as will enable this Committee to stimulate Provincial, Interprovincial and Dominion Organization within the ranks of the medical profession.

3. Be it further resolved that this Committee be subdivided

into Eastern and Western Sections as may be deemed advisable by the Committee so appointed and that a mail vote of this Committee be acceptable in lieu of the Committee convening."

AUDITORS' STATEMENT

Chairman of the Finance Committee,
Canadian Medical Association
Montreal.

Dear Sir:—

We beg to report that we have completed the audit of the books and accounts of the Association for the year ending the 31st December, 1919, and we attach certified statement of cash receipts and disbursements for the period.

We have verified the bank balance, have seen proper vouchers for the disbursements and have found the books in very good order. We are making a special report with certain recommendations which we consider will improve the accounting system.

Yours very truly,

Montreal, May 25th, 1920

MCDONALD, CURRIE & Co., C.A.,
Auditors

STATEMENT OF RECEIPTS AND DISBURSEMENTS, YEAR ENDING 31st DECEMBER, 1919

<i>Receipts</i>		
Balance in Bank, January 1st, 1919		\$474 65
Annual Fees, Paid Direct	\$2,616 97	
Paid by Draft	3,992 20	
		6,609 17
Special Illustration Fund		1,643 70
Reprints		600 62
Sundries		19 75
		<u>\$9,347 89</u>
<i>Disbursements</i>		
Editorial Secretary's Salary		\$420 00
Refunds Paid Provincial Societies:		
Alberta	67 50	
British Columbia	23 50	
Manitoba	49 50	
New Brunswick	28 50	
Nova Scotia	28 00	
Saskatchewan	21 50	
		<u>218 50</u>

Journal Account:

Renewals and Subscriptions.....	\$1,888 00	
Illustrations and Sundries.....	283 36	
Murray Printing Co., on a/c Morang.....	600 00	
Printing.....	2,557 45	
Authors' Alterations.....	35 00	
Agents' Commissions.....	16 00	
		\$5,379 81
Reprints.....		676 42
Clippings.....		132 00
Montreal Medical Journal Co—Payments to Stockholders \$5,000 at 6%...		300 00
General Expenses:		
Auditors' Fees.....	\$25 00	
Bonus, Acting Secretary, 1917.....	150 00	
Lawyers' Fees.....	70 00	
Postage.....	145 00	
Salary, Secretary's Assistant.....	1,065 50	
Stationery and Printing.....	181 30	
Sundries, Telephones, etc.....	85 96	
Travelling Expenses.....	180 65	
		1,903 41
Balance in Bank, December 31st, 1919.....		317 75
		<hr/> \$9,347 89

Certified Correct,

(Signed).

McDONALD, CURRIE & Co.

Chartered Accountants

Montreal, May 25th, 1920.

Miscellany

Book Reviews

HENRY QUIN, M.D., president and fellow of the King and Queen's College of Physicians of Ireland, and King's Professor of the Practice of Physic (1718-1791). BY T. PERCY KIRKPATRICK, M.D., M.R.I.A., fellow and registrar of the Royal College of Ireland. Printed at the University Press, by Ponsonby & Gibbs, Dublin, 1919. Price 10/6 net.

In this brochure of sixty pages with numerous illustrations we are given the very interesting story of the life of an eminent Irish physician who was not only a shrewd diagnostician, and successful practitioner enjoying the most fashionable and one of the largest practices in Dublin during the latter half of the 18th century, but was also an accomplished musician, a keen collector of ancient gems both cameos and intaglios and an artist himself of no mean ability. The story is an interesting one as giving a picture of life in Dublin at this period. Dr. Quin made no contributions to medical literature.

A. D. B.

LONDON AS A MEDICAL CENTRE

THE BRITISH FELLOWSHIP OF MEDICINE

THE best tribute to the need for the Fellowship of Medicine, is the steady flow of medical post-graduates to London from the British Dominions overseas. The Fellowship was founded in July, 1918, at a meeting convened by Lord Eustace Percy with a view to establishing a body which might unite the British profession with their overseas brethren in closer bonds of sympathy, Sir William Osler acting as president to the time of his death.

There are the best of reasons why the English-speaking medical man should come to London. The great city and its environs comprise a population of over 10,000,000 souls, thus affording an amount of clinical material which cannot be approached for variety of interest by any other city in the world. London is the natural centre and headquarters of the British people, and the traditions of London are the inherent traditions of our race. Hitherto the requirements of medical post-graduates have never been adequately met. The Fellowship of Medicine is now steadily co-ordinating an organization which embraces every general hospital and most of the special hospitals within the metropolitan area. The medical man who arrives in London from the Dominions will find a hearty welcome and every opportunity for study that the schools can offer.

A Canadian medical journal, whilst advocating London as a Mecca for medical study, suggested that here was another case in which England must wake up. A perusal of the recent issues of the weekly Bulletin of the Fellowship proves that London is very wide awake, and, whatever faults the Old Country may be accused of, sleepiness is not a failing of the present generation. At the offices of the Fellowship of Medicine the overseas medical man can obtain detailed information with regard to study in every branch of medical and surgical work. If he takes out the monthly ticket of the Fellowship practically every door in medical London is open to him. Intensive courses in various branches are now running throughout the year, and lectures are given day by day. The Bulletin provides a daily programme of work in the wards and out-patients' departments of the hospitals affiliated to the course, together with a syllabus of each course, and a list of the daily lectures. Application for copies of the Bulletin is welcomed, and, if correspondents will state the particular subjects they are interested in, information of future arrangements will be forwarded from time to time. The offices of the Fellowship of Medicine and Post-Graduate Medical Association are at present at the House of the Royal Society of Medicine (by courtesy of the Royal Society of Medicine), No. 1, Wimpole Street, London, W. 1., England.

